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TREATISE

ON

PULMONARY CONSUMPTION,

IN WHICH

A NEW VIEW

OF THE

PRINCIPLES OF ITS TREATMENT

IS SUPPORTED BY ORIGINAL OBSERVATIONS ON EVERY PERIOD OF THE DISEASE.

TO WHICH IS ADDED,

AN INQUIRY,

PROVING, THAT

THE MEDICINAL PROPERTIES

OF THE

DIGITALIS, OR FOX-GLOVE,

ARE

DIAMETRICALLY OPPOSITE TO WHAT THEY ARE BELIEVED TO BE.

BY JAMES SANDERS, M. D.

ONE OF THE PRESIDENTS OF THE ROYAL MEDICAL AND ROYAL PHYSICAL SOCIETIES OF EDINBURGH.

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1808.

BOSTON MEDICAL LIBRARY
IN THE
FRANCIS A. COUNTWAY
LIBRARY OF MEDICINE

TO

JOHN HEPBURN, Esq.

of Sideserf.

DEAR SIR,

I address this Work to you, because, investigating the Subjects of which it treats, I have been animated by that sentiment, which I, at an early period of life, heard you inculcate in a manner that did honour to your judgment, and made an indelible impression on my mind: you maintained, that ignorance is a crime of enormous magnitude, and that a blind con-

fidence in the authority of great names, is the most contemptible species of it. I am,

SIR,

Your sincere Friend,

JAMES SANDERS.

Edinburgh, 12. *James's Square*.
Dec. 15. 1807.

INTRODUCTION.

CONSUMPTION of the Lungs was the first disease which I wished to understand; for this purpose I applied to authors, little suspecting, that a malady coeval with the human race, and so generally pernicious, had not been amply explored, its nature as definitely as possible explained, and its treatment conducted on some well established principle; I was consequently much disappointed, when I found, that every thing relative to this affection was involved in obscurity and confusion.

One could scarcely perceive from their writings, that authors had ever attempted to relate the symptoms in the order of their occurrence and consistently with the changes which succeed in the constitution; and this probably is the chief cause, that

they do not agree with regard to its nature, though of bodies deprived of life by consumption an infinite number has been examined with great patience and anatomical discrimination.

The nature of the disease not being ascertained, its causes, and the relation which it bears to other diseases, could hardly be pointed out with precision; accordingly, the causes of consumption have been confounded with consumption itself; and there is not one nosologist who has reason to be satisfied with the place assigned to it even in his own arrangement.

Where science is imperfect, specious opinions too often usurp the authority of sound principles, and the proceedings of the artist are dictated by caprice, supposition, or fancy. This is strikingly exemplified in the treatment of phthisis pulmonalis. Here every one has some favourite remedy, which he prescribes without regard to age, sex, peculiarity of constitution, or period of the disease.

The Author of the present Treatise is far from presuming, that he can accomplish the necessary reformation; but, that the affection be systematically investigated, that the more important doctrines and opinions of physicians concerning the nature of it be examined with the most candid freedom, and that the treatment of it be improved, is what he most solicitously desires; and if his feeble efforts have even any influence in directing the attention of men of genius and learning, or contribute in any way to the attainment of this object, most interesting to humanity, he will not have laboured in vain.

For reasons which will appear on perusal, this Work is divided into two parts: in both, I have occasionally used freedom with great and venerable names, but never with any intention to diminish their lustre; if, indeed, assisted and guided by that light which they afford, I have sometimes discerned their imperfections, I would no more presume to blame them, than to blame the

glorious sun, because by his rays I was enabled to discern spots on his disk.

I esteem it the highest honour that can be done to a great man, to study his works with the stern severity of criticism, in order that, unretarded by error or prejudice, the truths in which they abound may proceed to augment the happiness of mankind.

The First Part treats of Consumption of the Lungs.

The Second Part is an experimental Inquiry concerning the Digitalis or Fox-Glove, one of the most important of those substances which have been employed as remedies in consumption.

This plant, according to Linnæus, of the class didynamia; order, angiospermia; natural order, solanaceæ; has but lately been added to the list of remedies; it is however, not requisite to enter here, either into the botanical or medical history of it, as both are well detailed in the account of foxglove given by Dr Withering, and in other medical and botanical books.

The object of this part of the Work is to prove, that the powers of this substance on the living body are misunderstood, and that it is in general administered for purposes which it tends to frustrate, but never can fulfil.

To this Inquiry I have devoted much time and attention; I have watched its effects in those of every period of life, and of every degree which the inequality of wealth can create in artificial society; in persons enjoying health of every temperament or habit of body, and in those labouring under every state of disease. In ascertaining the facts, I had the assistance of a number of well-informed and ingenious gentlemen, some of whom are already well known in the republic of literature and science, and others of whom we shall soon see ranked among the most eminent of the medical profession. In short, I have observed its effects in all the variety of circumstances which I could devise, and have used all the means in my

power that I might not be deceived concerning it.

The cases detailed and opinions advanced, have, in their progress, been annually discussed in the Royal Medical and Physical Societies of this city; during which opportunities, I availed myself of every useful suggestion made by any of the ingenious members of those invaluable institutions.

While occupied with this Inquiry, facts presented themselves which seemed to me not only to improve our knowledge of the nature and treatment of consumption, and explain several paradoxical tenets in physiology and pathology, but to be importantly illustrative of the nature of hæmoptysis, hydrocephalus, anasarca of the lungs, and dropsy in general.

These latter affections are reserved as the subjects of separate publication; the one concerning which I intend next to address medical men, is the hydrocephalus. I think it may be proved, that the commencement of this disease is, in general,

more evident, and its progress more easily arrested, than they are understood to be. Were I permitted to advise, there is no affection that I would more earnestly recommend to the attention of the zealous student of pathology; for certainly that man, who shall have the good fortune to discover a method of completely preventing or curing hydrocephalus, will do a service to the most innocent and helpless of our species, equal to the discovery of the vaccine innoculation, which, during these ten years, has preserved more lives than the most bloody and ruinous war that ever infested the earth, has destroyed.

The facts contained in this Work, have been both selected and ascertained with great care. The Author avers, with the firmness of conscious rectitude, that he has been more anxious to know the truth, than to promulgate novelty; he chuses no inference that does not seem to flow spontaneously from the facts. He has however, committed and witnessed too many mis-

takes, not to know, that error is the infirmity of our nature, and has seen too much reason to deprecate the consequences of perseverance in error, not to deem himself guilty of treason against the majesty of truth, if he wielded the arms of sophistry even in his own defence; but, whatever inaccuracy there may be found in the reasoning, whatever faults in the composition, which neither time allowed, nor experience qualified him to polish, he trusts, that the experiments and the results of observation here related, can bear the strictest scrutiny; and hopes, that no one will condemn him on their account, till they have been, with equal care and patience, repeated; when it will be the pride of the Author to confess obligation to him by whom he shall be corrected in this only instructive and philosophic manner.

CONTENTS.

PART I.

TREATISE ON PULMONARY CONSUMPTION.

CHAPTER I.

HISTORY OF PHTHISIS PULMONALIS.

Page

SECT. I. Incipient Phthisis, or a Detail of those Symptoms which precede Distinct Inflammatory Action 1

SECT. II. A Detail of the Inflammatory Symptoms which terminate in and accompany Suppuration - 9

SECT. III. A Detail of the Symptoms indicating the Presence of Pus, &c. - - - 12

SECT. IV. A Detail of the Symptoms indicating the Presence of Mortification - - 22

SECT. V. Account of several Circumstances attending the Disease, and Varieties which occur in the Symptoms, but which could not be easily comprised in the General History - - - 25

SECT. VI. State of the Mind, and Emaciation in Phthisis 32

CHAPTER II.

CONCERNING THE NATURE OF PHTHISIS PULMONALIS.

SECT. I. Explains how the Nature of Phthisis Pulmonalis is to be ascertained, and details the Morbid Changes which the Lungs suffer - 41

Page

SECT. II. The Nature of the Disease, and some of the Discordant Notions of Authors concerning it 45

SECT. III. Inquiry concerning the signification of the name Phthisis Pulmonalis, in which the bad consequences of its indefinite and vague application are pointed out, and a precise and unambiguous signification assigned to it - - - 49

CHAPTER III.

PREDISPOSITION TO, AND CAUSES OF INFLAMMATORY PHTHISIS PULMONALIS.

SECT. I. Predisposition to Phthisis Pulmonalis 62

SECT. II. Causes of Phthisis Pulmonalis - 66

CHAPTER IV.

ON THE DIAGNOSIS OF PHTHISIS PULMONALIS.

SECT. I. The chief Affections, which in their Symptoms resemble Phthisis Pulmonalis - - 71

SECT. II. Whether the Disease may be known from the Expectoration of Pus, &c. - - 78

SECT. III. Whether Hectic Fever is a decisive proof of the existence of Phthisis - - 83

CHAPTER V.

NOSOLOGICAL ARRANGEMENT.

SECT. I. Errors in the Judgment of Authors with regard to the Place which they have assigned to Phthisis Pulmonalis in Nosological Arrangement - 85

SECT. II. General Observations on the Principles of Classification - - - 92

CHAPTER VI.

VIEW OF THE NATURE AND TREATMENT PRINCIPALLY OF PHTHISICAL AFFECTIONS NOT TO BE CONSIDERED AS INFLAMMATORY.

Page

SECT. I. Phthisical Affections independent of Inflammation, with the different Species of Phthisis Pulmonalis - - - 100

SECT. II. In which are chiefly considered the Symptoms and Treatment of the Second Species, or that which is independent of Inflammation - 104

SECT. III. Phthisical Affections commencing without Inflammation - - - 109

CHAPTER VII.

TREATMENT OF THE FIRST STAGE.

SECT. I. General Observations concerning the Treatment of Inflammatory Consumptions of the Lungs, from their commencement to their termination 120

SECT. II. Treatment during the Inflammatory Symptoms which terminate in and accompany Suppuration 127

CHAPTER VIII.

TREATMENT OF THE SECOND OR SUPPURATIVE STAGE.

SECT. I. Treatment according to the Different Appearances of the Sputa - - 134

SECT. II. Treatment as regulated by the various Phenomena of the Fever which attends Ulceration 142

Page

SECT. III. Account and Explanation of the Effects of Posture on the Heart and Arteries, in Health and Disease, and the Reason assigned why a certain Position is easiest for the body of an enfeebled Person 149

SECT. IV. What Kinds of Exercise, and when Sea Air and Change of Climate are to be advised 155

SECT. V. Utility of inhaling certain Substances to promote the healing of Ulceration in the Lungs 161

SECT. VI. Utility of administering Digitalis in the Suppurative Stage - - - 174

SECT. VII. New Modes of Treatment proposed for the removal of Air or of Puriform Matter from the Cavities of the Chest - - - 176

CHAPTER IX.

TREATMENT OF THE THIRD STAGE 184

PART II.

INQUIRY CONCERNING THE MEDICINAL PROPERTIES OF THE DIGITALIS.

CHAPTER I.

EXPERIMENTAL PART OF THE INQUIRY.

SECT. I. Preliminary Observations - - 189

SECT. II. Concerning the Effects of Digitalis on the Pulse of Healthy Persons - - 192

SECT. III. Reasons for believing that the Digitalis is administered on False Principles - 200

SECT. IV. Demonstrates, that the Digitalis is administered on False Principles, and that its Primary Operation is powerfully Stimulant - 213

Page.

SECT. V. Shows, that the Digitalis may be successfully administered, and in such a manner as to avoid that Debility which has been reckoned its Proper Effect - - - - - 244

SECT. VI. Communication on the Powers of the Digitalis, from Mr J. De Courcy Laffan, one of the Presidents of the Royal Physical Society of Edinburgh 270

CHAPTER II.

THE FACTS ASCERTAINED CONCERNING THE OPERATION OF THE DIGITALIS APPLIED TO THE EXPLANATION OF THOSE CIRCUMSTANCES WHICH HAVE LED TO THE MISTAKEN OPINIONS PREVALENT ON THIS SUBJECT; AND THE NEW PRINCIPLE FOR THE ADMINISTRATION OF THE REMEDY FURTHER ILLUSTRATED.

SECT. I. Operation of Digitalis, with some Observations on the Nature and the Manner of Action of those Powers which maintain the Vital Phenomena 274

SECT. II. Opinions of Authors examined, and their Inconsistencies pointed out - - 284

SECT. III. Endeavours to show those Occurrences which misled Physicians in forming their Opinion concerning the Powers of Digitalis - 291

SECT. IV. Comparative Effects of the Digitalis 303

SECT. V. Administration of the Digitalis - 311

PART I.

TREATISE

ON

PULMONARY CONSUMPTION,

&c.

TREATISE, &c.

CHAPTER I.

HISTORY OF PHTHISIS PULMONALIS.

SECTION I.

Incipient Phthisis, or a Detail of those Symptoms which precede Distinct Inflammatory Action.

IN certain persons, at an early period of life, but most remarkably about the age of puberty, occur tension and pain of chest, more or less severe, with titillation of the fauces, and slight short dry cough, readily excited by hot drink, especially if it contains ardent spirits; to which are frequently added drowsiness, and a sense of weight in the head; occasionally, headach is the only thing which distresses them. All of these symptoms are often relieved by a spontaneous epistaxis, or hæmoptysis.

Whoever is so affected can neither run nor climb with the same ease of respiration as others; without incurring greater danger than others indeed, or often without immediately increasing the complaint, he can neither exert his voice, nor forcibly retain the air in his lungs; he cannot inhale acrid fumes, as of coals, metals, and acids; he cannot live in a marshy country; he cannot expose himself to the extremes of heat and cold, to showers, to an atmosphere loaded with moisture, nor to any great vicissitudes of weather; he can neither neglect the natural evacuations, nor omit the artificial, such as venæsection; he can neither be greatly grieved nor greatly exhilarated; he cannot devote himself to excess of study, to long watching, to abstinence, nor to any privation; he can neither indulge indolence, nor enjoy the gratification of active amusement; he cannot, in eating or drinking, exercising or resting, nor, finally, dare he, in obedience to the dictates of appetite or passion, deviate from the golden rule of mediocrity.

Sometimes he heaves a deep involuntary sigh; he may be surprised by a dyspnœa, for the attack of which no reason can be

assigned; by an uncommon degree of paleness of countenance with a sense of feebleness; or even by nausea, when he thinks himself in the best health: this dyspnœa is often of a spasmodic nature, and alternates with spasmodic affections of the urinary organs, which has induced some to believe that they were threatened with urinary calculus.

During autumn, winter, spring, he is very liable to catarrh with a copious saltish expectoration of various consistence and colour. In these seasons the plurality of the above symptoms is much aggravated, and very grievously in a rainy autumn, if preceded by an exceedingly hot and dry summer *; the cough, in particular, is often so severe as to excite vomiting with pain of chest usually referred to one of the sides, and the most excruciating headach.

Not unfrequently such persons are asthmatical; to them, frightful dreams with muttering or even walking in sleep, and incubus, are not unusual. They are whimsical, naturally generous, sometimes prodigal; they are often remarkable for the

* Hippoc. aph. 13. and 22. sect. 3.

finer sympathies, are sometimes adorned by nature with personal grace and intellectual superiority; they are generally addicted to the pleasures of love, are of acute sensibility and irascible, they often abound in mirth and fancy, but are more often affected with melancholy.

Very many of them become fond of convivial intercourse and intoxication, as a refuge from that occasional despondency to which they are particularly liable. Some of them, for perhaps several months, proceed in an almost uninterrupted course of astonishing dissipation, by which they may even seem to have meliorated their health, though, even during this, the greater number is often awaked by short but dreadful menaces of instant suffocation; and poignant regret, languor, mental and corporeal infirmity most certainly overtake all of them, when the disease may make unconquerable progress.

Such individuals are known to have been affected with great disorder of mind, for the most part of the gloomy character. They supposed themselves betrayed and surrounded with enemies, and persons formerly loved or admired were the chief objects of

resentment. In this state suicide is threatened, and, we have reason to suspect, not rarely perpetrated. The paroxysm of frenzy generally succeeds indulgence in the use of strong drink; it continues for perhaps a day or two, after which the mind becomes sound, and the person is happy at the escape which he has effected from himself.

There are intervals of entire immunity from suffering, even for the space of a year or two, but these are generally confined to the warmer and more uniform seasons; and, in the colder months, a similar series of complaint is repeated annually, with different degrees of severity, in some instances for twenty or more years; during which time there has often been felt a troublesome chronic heat in the extremities.

Disease and time (what in nature do they spare!) have gradually undermined the constitution; the patient is convinced, that the affection has imperceptibly become worse, and that his life is now in danger. The appetite is impaired, and food received into the stomach creates uneasiness or squeamishness, relieved by eructations and discharges of flatus; this squeamishness comes on with a sense of weakness

referred to the breast, and is accompanied with a flow of a warm saltish liquid into the mouth; the bowels are obstinately constipated; there are sometimes very copious discharges of limpid urine; headachs are more frequent and acute; he is benumbed, sluggish and drowsy; he feels his eyelids stiffened and agglutinated, and has a bad taste in the mornings; the lips are often dry; the tongue is in general moist, its superior surface is covered with something white and brown in the middle towards the root; his cough, which was formerly more noticed by his friends and relations than himself, and the titillation of the larynx are now very distressing, particularly in the evening, morning, and frequently on awakening in the night: the dyspnœa is often very oppressive, aggravated by the least motion, and in sleep impresses the mind with the most hideous images, difficulties insurmountable and situations of instant peril; if he walk much or stand, he is first sensible that his shoes become too tight, and next, he feels pains in his ankles with a teasing uneasiness in his feet, as if they were punctured by a great number of needles, and now he observes

that his feet always swell toward night; the pulse is nearly of the usual number, and, like that of a healthy person, increases about five beats per minute on changing from the lying to the sitting posture, and five more on standing; but is much more readily accelerated by more active exercise, by which also his body is sooner heated.

Emaciation makes evident progress; cold air, dampness, wet feet, or cold any how applied, produces an uncommon degree of chilliness, attended always with an instantaneous paleness and sharpening of the features, corrugation of the skin all over the body, and some peculiarly uneasy sensations, and often with a very disagreeable stifling and hoarseness; vomiting, particularly in the morning on taking tea, is very frequent, and at last becomes constant on taking the usual food, for which invincible disgust soon supervenes; the face becomes pale or yellowish, except that an inconstant redness occasionally enlivens the countenance; the eyes put on a pearly whiteness, sometimes beautifully variegated with red streaks; the teeth also whiten; the skin is often hot; the lips, tongue and fauces, dry; often an unaccountable chil-

liness with shivering, intervenes; there is a sense of feebleness about the præcordia, and acute pains dart in the head and in the thorax; severe pain is sometimes fixed about the scrobiculus cordis, or between the shoulders; at which time the breathing is quick and short, and the face flushed; tormina affect the bowels, which rather tend to constipation; the urine begins to redden, and is discharged sometimes with pain; uneasiness and slight pains impede the movement of the back, and of the joints of the extremities; the pulse is variable, has imperceptibly increased in number to about ninety, is rather stronger, and more evidently influenced by exercise, even of so mild a kind as change of posture; and, at the same time, the number of pulsations, and the heat of the body, are much increased by food; bodily weakness is now very great; fretfulness, peevishness and apprehensiveness of danger, are the characteristics of the mind.

SECTION II.

A Detail of the Inflammatory Symptoms which terminate in and accompany Suppuration.

SOON, however, the pulsations and the motions of respiration begin to increase most remarkably in number; the patient commonly lies on his right side, unless, as happens to many, there be a constant pain in it; he cannot sleep; is sometimes cold, sometimes hot, during the night, and often shivers with cold when the skin glows, or thinks himself oppressed with heat when the surface of the body is cold; the ears and face are often disagreeably hot, particularly after exposure to cold air; the heat of the palms, soles, and trunk, with general itching of the skin, is very troublesome; pains more severe than ever infest the chest; the cough is almost constant, it is short and dry, or accompanied with mucous sputa; he is attacked by severe paroxysms of asthma, which are terminated and relieved by copious expectoration of various consistence, sometimes transparent, sometimes yellow;

the patient cannot lie with equal ease on both sides, nor on any account make a full inspiration; some degree of dyspnœa is permanent; and his voice sometimes imitates the sound of a brazen trumpet; the tongue is foul and red, the fauces also redden; thirst is increased, appetite much diminished, and a thin saline fluid often collects in the mouth.

But these distressing sensations may be very much mitigated, and the person will, for weeks or even months, be able to perform all the common offices of life without much uneasiness from debility or emaciation, while the pulse beats in general from thirty to forty above the medium number of health; when he sits before dinner or any other meal, it will beat from ninety to a hundred; after a dinner of animal food, from a hundred and ten to a hundred and twenty; and it will be increased by from twelve to twenty beats per minute at any time when he stands or walks. The quicker the pulse is when one sits, the greater is the increase of its velocity when one assumes the standing posture, and the greater is the diminution when one lays ones self in the horizontal posture; the weaker

one is, the greater is the increase of the number of pulsations by bodily motion of any kind, and the greater is the diminution of their number when the motion is intermitted.

After no certain length of time the disease proceeds with rapid aggravation of all the symptoms; there is a perception of an uninterrupted tingling sound attended with vertigo, particularly if he attempt to sit; the smallest degree of noise, even that of walking or speaking gently, disturbs him; the eyes are suffused with red, and are acutely sensible to light; the heat of skin, the dyspnœa, the pains and burning with beating in the breast, become nearly intolerable; pains are, at the same time, felt in the limbs, or even over all the body; the bowels are very costive, the urine is red, and deposits a lateritious sediment; the œdematous swelling of the feet disappears; the sufferer is extremely restless; there is a sense of great heat in the fauces; the whole face is of a florid redness, changing to purple when the difficulty of breathing is very great; extreme anxiety is depicted in the countenance; the pulsations are strong and rapid, producing violent throbbing at the

temples, and headachs of indescribable torture, which may even induce wild delirium.

SECTION III.

A Detail of the Symptoms indicating the Presence of Pus, &c.

AFTER these symptoms have continued some time, there commences copious warm sweating, followed by severe cold shiverings; the pulse generally becomes softer, milder and slower, or may even intermit a little; to these symptoms succeed severe sickness, with a certain sensation of a tendency to faint, which terminates in vomiting of puriform matter, tinged perhaps with blood; now some degree of relief arrives. In many, indeed, the relief is so flattering, that for a week, or even a month, they think themselves nearly well, fever is scarcely perceptible, respiration easy, sleep sound, cough very mild, sputa in little quantity, white, smooth and easily expectorated, appetite improved, evacuations pretty natural; but in the greater number perhaps, the difficulty of respiration is rather in-

creased, and the other distressing sensations are only mitigated; severe dyspnœa with hoarseness may attack and go off spontaneously, often to be succeeded by strangury or even complete retention; there is a sense of weight and oppression in the breast, and sometimes a very acute pain in the side; the eyes are pearly again; the face more yellow and meagre; the temples collapsed; emaciation increased: and there is now very copious purulent expectoration.

After a species of smart continued fever may have proceeded for a few days, alternate accessions of heat and cold arrive, which gradually assume a certain regularity, and the cold seems to introduce the heat.

The cold fit approaches, accompanied with rigor, sweating, fluid sputa, sickness, vomiting, disgust of life, the most piteous looks, and not rarely low delirium.

The hot fit approaches, accompanied sometimes with desire of food, but when taken, the food may induce such cardialgia, pain and disturbance in the stomach and bowels, as to deter him from again indulging his appetite; this fit is, at the same time, most frequently accompanied with

expectoration less fluid, with hilarity and activity of mind, and not rarely with wild delirium; which exacerbation terminates in the effusion of copious sweats, first succeeded by an interval of remission, and next by all the phenomena of the cold fit.

In the cold fit the pulse is as quick, or even more so than in the hot, but is remarkably feeble, intermits, and sometimes flutters; the urine is generally copious and limpid, or contains a white sediment; though on many occasions, without any regularity, it is oily of surface, pale, reddish, muddy or transparent, in the cold, in the hot fits, and in the intervals; there is sometimes great uneasiness at stomach, relieved by discharges of flatus; matters discharged by the mouth soon begin to be of various colours, and exceedingly offensive; the breath is at the same time very noisome; the muscles of the thorax become relaxed, and the expectoration difficult: there may now supervene acute pains in the parietes of the breast during inspiration, while the intercostal muscles make impotent exertions to perform their duty, and also acute pains at the scrobiculus cordis from a similar affection of the diaphragm.

In the remission the pulse is almost as quick as in the hot fit, but is less variable, intermittent and feeble than in the cold; and, like that of all debilitated persons, will observe a range of from twenty to forty beats per minute of increase or diminution, when he changes from the horizontal to the erect posture, or the contrary. Sometimes the chilliness of a new fit will instantly succeed the sweating of the former, nor is there ever any remission, however complete, in which the pulse is not morbidly quick and morbidly excitable by every kind of exercise.

At some calm moment of the time which intervenes between the hot exacerbations, the patient is commonly overtaken by sleep, during which the mouth is open, and if much matter is collected in the bronchia, the respiration is very laborious and noisy; the nostrils expand and close, the pupils are turned upwards, and he often complains, groans, is oppressed, and awakes frightened; occasionally however, particularly after a copious expectoration, he may have a pretty tranquil, though very seldom refreshing sleep; he inclines to lie on his back, with his head and shoulders high,

and sometimes with his knees drawn up; the tongue is moist, and often of natural appearance; in this interval the spontaneous alvine evacuations occur; by cold drink the cough is excited or increased, and a spasmodic affection of the fauces and respiratory organs is induced.

In the hot stage the pulse is pretty regular and sharp, occasionally even very strong; the patient very seldom sleeps, and when he does, he speaks all the time of it, tosses and often exerts as if he were fighting; but if sleep entirely forsake him, if his face flush, if he be restless and uneasy night and day, if he be very irritable, start, stare and speak angrily, complain of headach, and be affected with strange fancies, it is to be dreaded, that an attack of furor, like that of phrenitis, will succeed. The tongue reddens and becomes sordid; the urine, though it is generally red, and deposits a lateritious branny sediment, is sometimes palish, and deposits a white sediment; though the bowels may be easily moved, they seldom have spontaneous evacuation.

The accession and continuance of the sweating which terminates the hot fit, seldom afford much relief; this sweating some-

times alternates with diarrhœa; the matter perspired is generally warm, but soon becomes cold; that which is perspired during the remission, is always cold.

The heart beats with great force in the hot stage, nor does it much abate either in the cold or in the remission, nay, the breast may sometimes be seen elevated by every contraction of the heart, and the neck swelled by every pulsation of the carotid arteries, when the extremities are cold, and their arteries nearly reduced to silence.

Mid-day and evening are the times of the hot exacerbation; the sweats are generally most severe during the night; some degree of relief, accompanied with great languor and debility, arrives in the morning, and a permanent circumscribed redness partially occupies the cheeks. This combination of symptoms, with no important alteration in the statement, has been considered of late to characterise the proper hectic.*

The hectic fits rarely occur in the same manner more than thrice in succession;

* Vide Cullen Synop. Nosolog. Method. Hecticæ Definitionem.

on some days there are many hot exacerbations, or there may be several attacks of cold even in a few hours: the former are generally succeeded, the latter attended by an increased expectoration. Chilliness may be experienced for about half an hour in the midst of apparent febrile activity; there may be chilliness succeeded neither by heat nor sweating; cold shivering and sweating without any intervening heat; heat and sweating together not preceded by cold.*

The hectic, or perhaps more properly the ulcerative fever, does not rage long before there recurs the œdematous swelling with pains of the ankles and feet, especially toward night; some considerable time after which, small aphthous sores cover the lips, the tongue, the inside of the mouth and fauces, most disagreeably tainting the breath, and rendering speech and deglutition very difficult; if he attempt to show his tongue it trembles in his mouth; at the same time, livid spots or petechiæ appear all over the surface of the body.

Often about this period there are great noise and commotion in the bowels; the

* Vide Heberden Comment. de Febre Hectica.

contents of the intestinal canal become coffee-coloured, and the stools, though voluntary, are loose and too frequent, indicating the approach of colliquative diarrhœa.

In a short time after this the more prominent parts of the body, which chiefly sustain its pressure in bed, run into very distressing gangrenous and sphacelating sores. The hands next, and face, but very remarkably the eye-lids, tumefy; in such debility, besides, there has occurred a sudden, great and unaccountable tumefaction, most remarkable in the abdomen, which vanished spontaneously.

In its duration, also, the violence of the fever increases, and its effects become still more alarming. In the occasional intervals of relief, he feels himself giddy, thinks that he sees insects flying before him, and knows that his memory and judgment are impaired. There occur subsultus tendinum or spasmodic motions, particularly of the muscles of the face and extremities; the legs and feet may become and continue to be spasmodically stretched and very painful. In the midst of a hot exacerbation, when the pulse is pretty strong and very rapid, the heart will suddenly cease to move,

and, after a few moments of fainting, will resume its activity. The minds of many become, with short interruptions, quite incoherent, through all the varieties of the hot and the cold; the person will sit up, and pick the bed-clothes, feel every thing near him very minutely, and move his fingers on the wall as if he were touching the strings of a harp; at another time, he will rise, and either not notice, or misname all those in his view; he will embrace imaginary visitors, and express himself happy to see those who have perhaps been long out of the number of the living; he will wonder, that he is so well, and promise himself much pleasure, when a transient return of reason dissipates the vision.—Kind delusion! one of those inventions of nature which, for some time, divest impending dissolution of her horrors!

In their turn, however, even the morbid powers of vitality exhaust themselves, the rage of the fever abates, the mind becomes consistent, the eyes are almost insensible to light, even very great noise excites no alarm, and now intervene drowsiness, torpor and unwillingness to be roused.

At such a time, may be presented to us a truly humiliating image of miserable extenuation. The bones which support the superstructure are greatly wasted; the soft investment which gave symmetry, grace and elegance, to the whole figure, has nearly abandoned the bones; the shoulders are extended like wings, and the inferior termination of the trunk seems to be elongated; the extremities also, with the incurvated fingers and toes, seem of unusual length; all the articulations of the joints seem swelled, the various portions of the stiffened spine, the ribs and their junctures, are distinctly perceptible; that soft covering, with which careful nature had anteriorly protected the admirably delicate organs of nourishment and of life, now forms a vast concavity in the middle of the body, and seems to be almost in contact with the posterior half of the circumference; the features are astonishingly sharpened; the eyes are hollow, clear and sparkling; the superior portions of the cheeks project, and, while the rest of the face is pale or livid, are covered with a florid redness; their soft parts are fallen in close on the teeth; the gums are shrivelled; teeth ap-

parently lengthened; and the open mouth imitates a ghastly smile!—who can behold this and not exclaim, What is man!

SECTION IV.

A Detail of the Symptoms indicating the presence of Mortification.

AT length, contrary to expectation, all pain and uneasiness suddenly cease; the respiration becomes easy, the mind tranquil; the patient believes recovery and health not far distant; this event indeed presages a speedy termination of suffering, but one far different from what most fallacious hope presents to the fancy of the victim.

Soon the charm vanishes; a universal tremor with a sensation of internal cold, fainting, hiccough, severe retching, unavailing desire to vomit, complete failure of the expectoration, consciousness of inability to perform any voluntary function, undeceive him: the pulse is very quick, feeble, irregular, intermitting, accelerated by the least

motion, and in the extremities scarcely perceptible. On his attempting to raise himself, the heart palpitates and flutters, or is quieted by fainting.

He now lies on his back with his limbs stretched out. The skin is permanently moist, and, except on the chest, scarcely warm, though transient flushes frequently intervene; there are many attacks of cold shivering with copious effusion of moisture, somewhat warm on the breast and forehead; the urine is pale, and the stools fetid, greenish, or black, and very frequent.

There often occurs an inconsistency of judgment, very different from the delirium either of the hot or cold stage: the person knows where he is, and can distinguish those near him, but yet seems bewildered, and, at intervals, makes childish inconsistent remarks.

The voice entirely changes, and the movement of its organ seems to be quite a mechanical operation, by means of inanimate soft substance; deglutition is nearly at an end, the greater part of the liquids put into the mouth is returned after some convulsive attempts to swallow; the hair

drops off; the volar* surface of the fingers and plantar surface of the toes are flattened, and the skin on them corrugated; the nails become incurvated, which, as well as the fingers and toes, are purple or livid; the eyes, now glassy, sink; the features are still more collapsed; not only the general countenance, but the lips, become deadly pale; he is much inclined to sleep, in which the inferior jaw separates from the superior spontaneously, and occasions a truly hideous appearance, which is increased by the peculiar sound of the breathing; not only the mouth, but the whole body, emits a sickening fetid odor; deglutition and voice are now entirely gone; pulsation gradually abandons the cold, the frigid extremities; the breast at intervals heaves with agonizing toil; the heart, convulsed, beats at the same time as if to burst its confines: the breath is cold and extremely fetid; sweats, cold and clammy, cover the forehead, face and neck, and are often very profuse, but still less cold about the middle of the trunk; the stools and discharge of urine are invo-

* Vide Nomenclature of Dr John Barclay, Lecturer on Anatomy, Edinburgh.

luntary, the former of a horrid appearance and smell—evident effects of extreme putrescence and debility: every thing announces the appalling departure of life; the dire commotion in the breast has ceased; the countenance is involved in a deeper shade; the eyes are sunk and circled with blackness; the subtile principle of mind vanishes; corruption and ruin have already seized their prey, and turned it into horror unutterable.

SECTION V.

Account of several Circumstances attending the Disease, and Varieties which occur in the Symptoms, but which could not be easily comprised in the General History.

THIS section is devoted to the relation of many interesting particulars, which could not be introduced into the general history.

The disease which we have been considering, occurs in every region of the world, and at every period of life; but it is most destructive and frequent in the colder lati-

tudes, where the atmosphere is moist, and weather inconstant; persons are in the greatest danger of it from puberty to about thirty-five years of age, though consumption has fatally terminated the career of many, in whom its approach had not been perceptible, in any form, before the fortieth year.

Males are less liable to it than females; the latter at puberty, in whom this disease has begun, are much more languid, pale, and enfeebled than the former.

Some of the phthisical are ruddy, others of sallow complexion; in the former of whom the symptoms, from the commencement, are generally violent.

Phthisis pulmonalis is frequently combined or connected with morbid affections of external and internal parts, but most frequently perhaps with those of the liver; in women it is often accompanied with violent hysterical affections, and has been preceded by amenorrhœa, or chlorosis; in most of them, however, menstruation ceases soon after purulent expectoration is begun.

Abortion often interrupts the pregnancy of the consumptive; though it is not uncommon for a mother to think her health

improved by that state, who, after having carried the child to the full time, presents it with sorrow to a world, which she feels she must soon leave for ever.

There is a great general resemblance in almost all instances, yet there is scarcely one symptom which can be affirmed to have been uniformly present at any period of the disease.

Smart transitory pains first attack the breast at uncertain intervals, or there is a general and permanent soreness, which is rendered severe by violent fits of coughing. The coughing and dyspnœa occur in paroxysms, like the asthmatical, during the whole course of many consumptions.

Phthisical symptoms may occasionally appear to have been quite removed by a copious menstruation; likewise, in either sex, unusually copious discharges of different kinds, as the cuticular, urinary, alvine, hœmorrhoidal, of blood from the internal parts, or even the suppuration of a tumor externally, may be immediately followed by the restoration of health.

Certain individuals have been afflicted with a cough and other signs of pulmonary affection, from which in a few years they

have unexpectedly had an entire recovery; others, less fortunate, after several pretty long intermissions of the cough and concomitant complaint, have at last been the victims of consumption—their insidious and inveterate enemy.

Sometimes the disease commences with fierce inflammatory symptoms, and is rapidly fatal; sometimes this fury abates, and the body wastes slowly.

Hectic fever often occurs in scrofulous persons, who are much enfeebled even before ulcers form, is converted into the inflamatory when the glands form abscesses of an active kind, and becomes an ulcerative rather than a hectic fever when the sores degenerate.

The purulent expectoration may cease, and the person seem entirely recovered, when unexpectedly the disease will resume the same course, and have again a similar termination; this has been more than once repeated in the same individual.

In the Journal de Medicine * it is related, that a man regained a tolerable state of health after having for many months ex-

* Tome xi. p. 216.

pectorated enormous quantities of puriform matter, in which, before convalescence, there came up certain substances of a membranous appearance.

" A youth of sixteen, (says Heberden*) after having the usual signs of a phthisis for many months, and being apparently in the last stage of it, was almost suffocated by bringing up at once a great quantity of matter, and, after a few days, the bag in which it had probably been contained. He soon recovered his flesh and strength, became a strong man, and lived to old age, with a family of robust children and grandchildren. Yet he was remarkably subject to a cough upon every slight cold, and had returns of spitting of blood several times every year."

Some persons, who have been very much reduced by ulceration of the lungs, as indicated by all the proper and usual symptoms, have had an entire recovery. Others have had portions of their lungs destroyed by ulceration, who had not been very perceptibly affected with fever, had not evinced any degree of emaciation, nor, within a few hours of death, lost their appetite.

* De Phthisi, p. 379.

In one, the disease has a short and violent course, even without any purulent expectoration; in another, it glides on a long time almost imperceptibly, or without being decisively marked by any symptom; a third has been affected with some pectoral uneasiness and slight cough from infancy to above fifty years of age, whom the most violent symptoms of it have then suddenly seized, and speedily destroyed.

The mildest consumptions often proceed with the most pertinacious constancy in defiance of art; sometimes a complete recovery arrives, which the most mature judgment could hardly have deemed possible.

In many persons, spitting of blood both precedes and accompanies the disease, or occurs some time or other during it; but in an equal number perhaps this symptom never appears. Very oppressive sickness generally attends the vomiting of blood, along with which various other matters are often ejected.

The expectoration is often observed to be very thick and viscid, of an ash colour with a slight tinge of green, and to contain many air-bubbles; sometimes it is white or yellowish, and in small round globules;

in it, gelatinous, sandy, calcareous, osseous and carneous substances, or even portions of the lungs, appear.

Before the fatal termination, particularly of the slower consumptions, there often supervenes hydrothorax, or universal dropsy.

The senses of one remain undisturbed, those of another are long incoherent.

One bears the disease with great good nature and resignation; another is fretful, capricious, hypochondriacal, and in horror on the slightest ungrateful change in his sensations; this last I have observed to be remarkably and invariably, in those to whom any great degree of hæmoptysis has happened. "It strikes terror," says ancient Aretæus, "to perceive, flowing by "the mouth, that blood, whence all of "mortal race derive their colour, their "heat, their nourishment*."

The life of some of the phthisical lingers, protracted beyond all expectation; but by the effusion of blood, purulent matter, or air, many are precipitated into eternity.

* De Morb. Acut. l. ii. c. 2.

SECTION VI.

State of the mind, and Emaciation in Phthisis.

IT would be superfluous to endeavour to explain the different symptoms, which the appearances on dissection will elucidate more amply and eloquently than any words; I shall only take the liberty to make some rather desultory remarks on the state of the mind, and the nature of emaciation which occur in this disease, solely with the view of suggesting the utility of such inquiries.

In order to arrive at any solid knowledge on such subjects, we must agree with Hippocrates, that the basis of all reasoning in medicine is the nature of the human body;* or, in other words, that the principles of life and of health, of disease and of cure, are implanted in the animate system, and by the exploring of it only, are discoverable.

From the most remote antiquity, it has been perceived, that not only the general

* Lib. de Loc. in homine, sect. 4.

actions of our bodies were excited, but that the viscera were affected by the passions, whence particular organs have been deemed the seat of particular passions, as the heart of courage, &c. which consideration alone seems to me completely subversive of the very ingenious opinion introduced as a theory by Bichat, that the voluntary and involuntary motions and organs are independent of each other; or, as he expresses it, that the animal life is quite independent of the organic.

Many observations indeed have been made, and many things have been ascertained, which demonstrate the reciprocal influence and dependence subsisting between the mind and body. Reflecting further, that every expression of voice, every change of feature or look, indicate both some operation of the mind and a degree of vital energy, we indulge the pleasing hope, that much valuable information may be obtained, when the revolutions of the mind, corresponding with the changes in the condition of the body, shall have been investigated with the scrupulous minuteness of scientific comparison.

It was to me an object of peculiar care to mark the state of the mind, both as modified during the progress of the disease and as influenced by those alternations which signalize the concomitant fever; in addition to which we may here observe, that during the milder exacerbations of the fever, or when it is of a gentle continued type, the mind is somewhat active and lively, but is still impressed with a sort of complacent melancholy, possibly from this, that the patient does not suffer acute pain, nor dread immediate danger, though, in the mean time, he is sensible of his increasing weakness, and is seldom diverted from thinking of his steadily approaching fate; but when the cold stage comes with shivering, vomiting, &c. his spirits sink to the lowest degree, and he often wishes that life would quit his wretched body. I have never seen an instance of far advanced consumption which warranted the account generally given, of the uninterruptedly high hopes of recovery, which delude the minds of persons labouring under this disease.

The emaciation is in phthisis accompanied with the general depravation of the digestive and assimilatory functions and

most frequently with a certain fever. Indeed any fever never fails to have ghastly emaciation as a companion, and the meagerness of the one is always proportioned to the fury of the other.

Considering the phenomena of this process, may one not suppose, that it is the immediate effect of a great alteration in the affinities of the body in relation to the materials conveyed to its different parts; and that, because no part undergoing decomposition selects for itself from the circulating mass, those particles which are necessary to supply the deficiency, the whole body diminishes in bulk?

To know, however, the disposition of the body necessary to the progress of emaciation, is not so important as to know the nature of those powers by which such disposition is induced, and the means or circumstances by which they are influenced.

It will perhaps be found, on comparing the effects of the powers which operate in health with the effects of those which operate in disease, that, contrary to the opinion of Brown,* they often differ in the

* Vide Elementa Medicinæ.

kind, and not always in the degree only, of their operation. A change of quality in the exciting power may occasion a difference in the combination of parts, as really as an excess of action may destroy their excitability or susceptibility of action; a difference, for example, induced in the affinities, may occasion the concretions of gout, those found in the different fluids and the morbid changes in the consistence and structure of parts, as certainly as an excessive exertion of that power, by which our muscles contract, may shatter, or completely destroy the animal machine.

Leaving this intricate subject to future experience, let me here point out a few changes, which are induced in the body by certain means, the knowledge of which would incalculably strengthen the efficiency of the art of medicine.

To recommence then, it were truly difficult to conceive, that emaciation should not ensue, when fever devastates, and the depraved nutrition cannot supply the body; but though emaciation always attends fever and morbidly diminished nutrition, yet the converse of the proposition is not true, for the body often diminishes as well as in-

creases in bulk, when infested by no such disorder.

The size of the body may not only be greatly influenced, at any period of its duration, by food, exercise, rest and the various avocations of life, but does, at fixed times, undergo very considerable spontaneous changes without the general health being impaired.

There are two remarkable stages in human life, in both of which, consistently with health, the sanguiferous system evinces a determinate change; in the one, which is from infancy to adult age, the pulsations diminish in velocity, while the body is enlarged and invigorated; in the other, from the close of the middle period of life, till vitality ceases to actuate this admirable structure, the pulsations become feeble, while the body gradually contracts and fades.

Beside which general results of the laws of the animal economy, there are local changes, at certain periods, also consistent with health and with those laws. The head, the spinal marrow, the nerves, the heart and the liver increase, at their respective times, rapidly in proportion to the other parts of the body, and next the trunk

and extremities rapidly in proportion to them.

In the infant, the cellular texture, which unites the skin to the external muscles, becomes loaded with adipose substance, while very little collects interiorly either about the heart or in the omentum, and while several large blood vessels are shrinking into membranes, and the liver is diminishing in volume.

The term puberty denotes an important epoch, and must suggest that interesting revolution by which it is characterized. At this time fatty matters have collected, and continue to form in the interior of the body, particularly about the heart, the kidneys, and in the peritonæum enveloping the intestines and composing the expansions of the mesenteria and omenta.

It is worthy of remark, that, from this time to about forty years of age, there is a tendency to general plethora, to inflammatory affections of the lungs and to obesity.

To about the eighteenth year, the body increases in length, after which, to the thirtieth, in its other dimensions. In short, there is no interval in which some organ

or part does not vary in its relative properties.

These are tendencies and changes of the constitution resulting from the original and inherent principles of our nature, which, within certain limits, contribute to our welfare, all of which, on the contrary, may be counteracted by disease, or destroy us by excess, there are likewise occurrences of a morbid kind, not only manifested in the general frame, but in single parts or organs, by which they may be increased or diminished, softened or hardened, in short, undergo an infinite variety of alterations in their form, structure and other properties.

From all these facts it appears, that there is a power in the system of altering the structure and of increasing or diminishing the magnitude of all or any of its parts seperately or conjointly.

Such events, mightily useful to the philosopher and to the physician, Bichat wishes to explain to be the result of the peculiar distribution of the vital forces as inherent in his animal and organic systems;* but if not more correct, would it not be more con-

* Anatomie Generale, tome iii. p. 408.

ducive to research, to maintain, that these are the effects of the particular distribution of the vital powers, or perhaps vital power, regulated in a manner which is not understood, because unexplored?

But in whatever manner these phenomena are conceived to be explicable, it is evident, that, if we could command the power, on which they depend, and direct its operation to any single part or to the whole body at pleasure, we should possess an almost unlimited control over an immense number of both local and general affections. I am convinced, that the changes from the healthy to the morbid actions of the body, their causes, concomitant circumstances and consequences, offer a vast field, the cultivation of which would be succeeded by a salutary and most glorious harvest.

CHAPTER II.

CONCERNING THE NATURE OF PHTHISIS PULMONALIS.

SECTION I.

Explains how the Nature of Phthisis Pulmonalis is to be ascertained, and details the Morbid Changes which the Lungs suffer.

PHTHISIS Pulmonalis, as the name imports, is an affection of the lungs, the nature of which, as of every other incident to our bodies, is only to be deduced from a comparison of those signs which indicate the deviation from health, with the appearances which are to be observed after death.

Those signs, as detailed in the preceding history, are such as indicate a progressive local inflammation; to which are added,* instances of destruction of the lungs, in

* Chap. i. sect. 5.

which death was not preceded by any proofs of such action. I shall now, trusting that the reader is acquainted with the anatomy and physiology of the lungs, state summarily what is observed in the thorax of the phthisical, after life has abandoned the body.

Very numerous and different are the appearances which present themselves on the examination of the bodies of those who have died of pulmonary diseases.

The lungs are in one wonderfully shrivelled, and in another enormously swelled; the lung of one side is almost completely obliterated, while that of the other has acquired uncommon size, and seems, for a considerable time, to have alone supported the function of respiration; even the air cells have been found prodigiously enlarged. *

The following case, of which I only give an abstract, is particularly worthy of attention. † A lawyer, æt. 51. of good constitution, but subject to coryza, was suddenly

* Morg. Ep. xxii. Art. 12. and Frid. Hoffmanni Oper. Tom. i. § 1. cap. xvii. p. 399.

† Obs. d'un Emphysème des poumons; par Taranget. Journal de Medicine, Tome xi. p. 373.

affected with difficulty of speech, accompanied with a disagreeable nasal sound. The uvula had assumed the form of a strawberry, and was amputated without affecting any change in the symptoms. He was sometimes surprised by deep and strong inspirations; the nasal sound increased; the voice became obscure; there was difficult deglutition; the continual ejection of mucous viscid sputa; the eye-lids and lips frequently convulsed, and he sometimes experienced dreadful paroxysms of asthma; there was no fever; the emaciation was very remarkable, and he died seven months from the attack.

On examination, the lungs were found quite impacted, as it were, in the thorax, and in the right side there were adhesions to the pleura; when taken out they distended themselves with the elasticity of sponge, to four times the size of their previous inclosures; when pressed there was great crepitation, and when cut at random black blood and air issued copiously.

In different instances, the substance of the lungs has assumed the appearance of muscle or tendon; is signally indurated with scirrhous, osseous, and calculous forma-

tions; is softened into adipose or gelatinous matter, and is disfigured by hydatigenous productions.

Though we learn from these appearances, that the lungs exhibit an infinite variety of change, which cannot be ascribed to any of the known effects of inflammation, it is sufficient for our present purpose, that the proofs of the ravages of local inflammation are quite convincing in the bodies of those who have during life been unequivocally afflicted with the violence of local inflammation.

Coagulating lymph is abundantly effused; there are thickening and induration; the mucous and serous membranes of the bronchia and pleura are often greatly altered or destroyed; adhesions are formed between the lungs and the surrounding parts, and between their different lobes; abscesses containing pus are formed in their substance, and ulceration has often made tremendous havock.

In the lungs of those in whom scrofula has exercised dominion, glandular swellings or tubercles present themselves, replete with matter of every colour and consistence, while part of the substance of the lungs

remains sound in the interstices; some of the tubercles contain pus, and others appear as if they have been arrested in their progress to suppuration; very many of them are not larger than small seeds, and others are of incredible magnitude. In fine, every species of sore, from the minute pustular to the large cancerous, every form of inflammation and effect of diminished vitality are manifested, from simple redness to complete sphacelation.*

SECTION II.

The Nature of the Disease, and some of the Discordant Notions of Authors concerning it.

WHEN the symptoms during life warn us that local inflammation is present, and when in the dead bodies of those in whom such symptoms occurred, we discover the well known effects of inflammatory action, the inference is plain, that phthisis pulmonalis is an inflammatory affection of the lungs.

* These facts are founded in the works of Plater, Frid. Hoffman, Bonetus, Morgagni, Lieutaud, Baillie, &c.

But whatever be the state of the lungs after death, if the symptoms of inflammation were not present during life, the disease cannot have been one of an inflammatory nature.

Whether there are any other than inflammatory consumptions of the lungs, shall be considered after we have inquired into some circumstances which principally concern that in which inflammation is certainly present.

That phthisis pulmonalis, however, is generally an inflammatory affection of the lungs, which produces the destruction of their substance, is an idea so definite and obvious, that one might have expected writers to be almost unanimous concerning the nature of the common form of this pernicious malady, which must have arrested the inquisitive attention of the wise, as well as interested the feelings of all mankind from the first dawnings of sympathy and philosophy.

But there is scarcely, in the records of science, a better instance of how far we may be led from the very object of our research by adventitious circumstances and the want of precise and definite terms. Though in-

deed every well educated person knows pretty precisely, that phthisis is a certain affection of the organs of respiration, yet, in the writings of physicians, the utmost confusion prevails with regard to all the circumstances of it: they scarcely, even now, agree that phthisis pulmonalis is a disease of the lungs!

In the judgment of Dr Cullen, and, as far as I know, every other author of modern times, no change, ulceration, abscess nor wasting of the substance of the lungs constitutes phthisis, unless hectic fever is present;* accordingly persons, as we have seen†, have died of consumed lungs without having been affected with pulmonary consumption!

Dr Brown, the celebrated antagonist of Dr Cullen, asserts, that persons have died of *pulmonary consumption*, though their lungs remained *perfectly sound!* ‡

Dr Darwin, if I understand him, thinks consumption of the lungs a disease of increased *sensation* without *feeling!* §

* First lines, vol. i. p. 482—494, &c.

† Ch. i. sect. 5.

‡ Vol. iii. p. 217, 594. note *m*.

§ Vol. iii. cl. ii. ord. 1. gen. 6. sp. 7. p. 455, 464, &c.

Dr Rush of Philadelphia maintains, that consumption of the lungs is a *primary* disease of the *whole* system.*

But such conceits are not altogether of the present day; Willis, a celebrated physician of the seventeenth century, asserts, that *pulmonary consumption is not the ulceration or corruption of the lungs*, but a general wasting of the body from their mal-conformation. †

Argenterius, of the sixteenth century, asserts, that *great wasting* of the body is *only a tendency* to consumption, unless the lungs are ulcerated! ‡

And if we go back to records of ancient date, besides opinions similar to those now mentioned, we find, that consumption of the lungs is a distillation from the head! ‖

* Dr Duncan's Med. Com. Dec. ii. vol. x. p. 70.

† De Medicament. Operat. sect. 1. c. v. p. 156. c. vi. p. 159. De phthisi propriè dicta, sive de tabe, pulmonum vitio excitata.

‡ In Aph. Hippoc. viii. p. 1322.

‖ Hippoc. de Morbis, l. 2. c. xviii. Celsi de Tabe, l. 3. c. xxii. Aretæi l. i. de Morb. Diut. c. viii.

SECTION III.

Inquiry concerning the signification of the name Phthisis Pulmonalis, in which the bad consequences of its indefinite and vague application are pointed out, and a precise and unambiguous signification assigned to it.

PHTHISIS, as derived from φθίω ἀ φθέω, generically signifies wasting or corruption, and seems from the earliest times of Grecian medicine, to have been generally appropriated to signify that wasting of the body which so frequently accompanies ulceration of the lungs; and, though the lungs were ulcerated, phthisis was not considered as constituted without progressive emaciation of the universal system; phthisis, in short, signified, not ulceration or wasting of the lungs, but wasting of the body from such ulceration.

This term did not, however, signify consumption of the body solely as arising from ulceration of the lungs, but also from the disease of any other internal viscus or

from any cause ;* it is of importance, therefore, to be aware, that Hippocrates did not mean an affection of the lungs always when he employed, either in the singular or plural form, the word phthisis unqualified. In like manner, tabes among the Latins did not always signify consumption of the lungs, nor tabidi, those labouring under pulmonary complaints, but these words imply a general wasting of the body from whatever cause.

Celsus enumerates three species of tabes,† the first called by the Greeks ἀτροφία, arising either from the deficiency or the superabundance of food ; the second, κακεξία, in which the habit of body and function of digestion are depraved, a distinction, as is not uncommon, merely verbal ; the third is φθίσις, in which the lungs are ulcerated. I suspect that there is here some inaccuracy, for though the commonalty in Greece, like that in Britain, might speak of consumptions indiscriminately, yet the common Athenian term for this idea, if I mistake not, would not be φθίσις but φθοη, a

* Etmulleri Operum tom. i. p. 280. De Nutritione. § Phthisis.

† De Tabe, l. 3. c. xxii.

word of the same ultimate origin. Nor did the most elegant and most eminent of the Greek medical writers exclusively characterize the ulceration of the lungs by the word φθίσις, but, in the most complete instances of the destruction of the lungs, preferred φθοη.

In the work of Aretæus there is, doubtless from the ravages of time, something not very intelligible about the difference between phthisis, empyema and phthoe; but when he speaks of ulceration of the lungs, with the violence of fever and the most destructive symptoms of consumption, he distinguishes the affection by the word φθοη.*

It has been observed, that Hippocrates did not always mean that the lungs were diseased, when he used the word phthisis; of this we may readily satisfy ourselves by examining his prognostications and aphorisms; here we may add, that he did not always use the word phthisis when he intended particularly to express consumption of the lungs. In his work Περί Νεσων, we find, φθίσις νωτίας, *tabes dorsalis*, though he

* De Morb. Diut. l. i. c. viii.

had, in the preceding chapter, used φθοη to denote consumption of the lungs. Ἑτέρη νοσῳ ἥτις καλεεται φθοη.*

Well has Lord Bacon said, "Knowledge is power." By his immense information, under the direction of transcendent genius, Hippocrates became the sovereign of the medical world, and, O fate! the majority of mankind seem destined to slavery! his very errors, for many centuries, had the authority of laws.

The supremacy of Hippocrates was acknowledged by the victorious enthusiasts of barbarous Arabia; nor has it been disputed since the revival of learning, and never will while medicine is revered. The conquest of empires, and discovery of great portions of the globe, have only added to the number of his admirers and increased the extent of his dominion. How much more enviable is the glory of Hippocrates at this day, than was that of Cesar, even then, when he rode in triumph, attended by vanquished chiefs and elated by popular acclamation!†

* Hippoc. de Morbis, l. 2. c. xviii. and xix.

† Many valuable notions are to be found on this subject, in the elegant and scientific work of P. J. G. Cabanis. It has

Soon after literature and science began to banish ferocity, superstition and romance, from the western hemisphere, the spirit of truth, in defiance of the prohibition of the schools, asserted the right of correcting and improving the doctrines of Hippocrates. The human mind was now unrestrained; great advancement was made in medicine; who has not heard the names of Vesalius and Harvey? But the regions of fancy are much more alluring than those of science; hypotheses innumerable were created, or rather those of the Grecian schools were revived and carried to the utmost extravagance; even Paracelsus, Helmont, Boerhaave and Stahl, men of superior intelligence and singularly acute in discerning many errors of the ancients, were captivated by these magnificent phantoms of delusion.

This digression at least shows, that every addition or alteration was not an improvement; to which I may add, that because phthisis or great extenuation of the body, very often accompanied a diseased state of

lately been translated into English by Dr A. Henderson, entitled, "Sketch of the Revolutions of Medical Science."

the lungs, it became a prevalent opinion, that wasting of the body always arose from disease of this viscus, whether ulcerated or not. Willis * having found, on dissection, what was well known from time immemorial, that persons died of a universal consumption without the lungs being ulcerated, wished the term phthisis to signify a consumption of the body arising from a mal-conformation of the lungs; though he neither informs us in what this peculiar conformation consisted, nor proves that, in the bodies to which he alludes, it had existed. A thought not much different we find in Aretæus, † "If any one has a hard, dry cough, and is consumed by chronic fever, he is, with no very great impropriety, considered to be phthisical, though his lungs are not ulcerated." Of the same import is the expression, spurious consumption—can a part consume falsely? We may here remark, that it is impossible for the body to be wasted and greatly enfeebled by any disease, without the lungs participating in the general calamity, and it would be equally

* De Phthisi proprie dicta, &c. De Medicament. operat. sect. 1. c. vi.

† De Morb. Diut. l. 1. c. viii.

proper to attribute generally to their fault, every other infirmity, with that of emaciation.

And whatever have been the occasional or particular acceptations of phthisis, we are authorised from ample documents to affirm, that this word has, in the writings of physicians, continued chiefly to denote a general wasting of the system from a diseased state of the lungs; even when the epithet pulmonaris was added, the lungs were not chiefly considered, on the contrary, the extenuation of the general system was deemed the essential part of the affection, and not only those to whom medical inquiries were supererogatory, but a great number of medical men were satisfied, that great extenuation of body was a decisive proof of phthisis pulmonalis, in whatever state the lungs might be.

Now, without expatiating further on the various applications and misapplications of the word phthisis, we may perhaps, in the confusion of the judgment, caused by the custom of thinking the wasting of the body to be the chief object of consideration in phthisis pulmonalis, discover the reason of

the strange opinions of authors which are related in the preceding section.

The notion, that wasting of the general system is essential to pulmonary consumption accounts for the opinions of Argenterius, Willis and Cullen; that general extenuation proved the presence of pulmonary consumption, accounts for the opinions of Brown and Rush.

The opinions of Hippocrates and Darwin, though more subtile and hypothetical, can also perhaps be traced to their source.

The ancients supposed, that there were an intimate connexion and communication between the encephalon, the fauces and the lungs; that, chiefly by means of the pituitary gland, often descended the matter of catarrh which escaped by the nose and mouth; and also the matter which was expectorated in pulmonary affections, which have always been so intimately blended with the catarrhal.

The ancients also can claim the opinion, that the substance of the lungs is nearly insensible, and that they are so, in the healthy state, I have satisfied myself by experiment, but in the diseased state, they are frequently of exquisite sensibility: it would

seem, however, that the fact of the lungs being often greatly diseased without exciting any great local pain, while the velocity of the circulations was greatly augmented, has probably had some influence in suggesting to Darwin the idea which is ascribed to him above, and which seems predominant in all that he has written on this subject.

Many years ago, when a boy at school, the translation of the first eight words of the Metamorphoses of Ovid, convinced me that misconception is the parent of absurdity.

In nova fert animus mutatas dicere formas
Corpora.——
It is my design to sing of forms changed into new bodies,

says, as is believed, the author; but the literal interpretation of these words, says the annotator, is absurd, for forms cannot be changed into new bodies, and with him agreed the preceptor.

In consequence of these conjectures the scholar was obliged to construe the sentence thus:

Animus fert dicere corpora mutata in novas formas.
It is my design to sing of bodies changed into new forms;

but, thought the pupil, if forms cannot be

changed into bodies, neither can bodies into forms; therefore, by this contrivance the meaning is not improved.

It was learnedly supposed, besides, that the poet being about to write of the transformation of bodies, had, in allusion to his design, begun his subject with a transformation in the grammatical structure of the sentence; as if an author would wilfully commence with unintelligible nonsense as an indication of his production!

May we not believe, however, that Ovid just meant what he said, and that his words were,

In nova fert animus mutari dicere formas
Corpora ——

which should be construed thus,

Animus fert dicere corpora mutari (secundum) formas in nova.

It is my design to sing that bodies, by changing their form, are converted into new bodies.

since the metamorphoses are chiefly founded on the Epicurean doctrine, that certain indestructible and immutable atoms, by their various combinations, constituted the universe. It was undoubtedly an opinion of this kind that suggested the search for the philosopher's stone.

Some carried the doctrine of forms still farther, and maintained, that nothing but forms existed, whence originated the hypotheses of Boscovich and Berkeley; the former supposed the universe of realities to be a combination of nothings, the latter, the solid objects of sense to be an order of ideal phantoms.

These considerations, I presume, furnish a convincing proof, that we must attach precise ideas to all important words, if we wish to avoid important errors.*

That the name phthisis pulmonalis or consumption of the lungs may acquire a definite acceptation, we must, in the investigation of the diseases of the lungs, make the lungs themselves and the changes which they undergo, the primary objects; and, whatever symptoms are present or absent, whatever is the state of the general system, whatever are the sensations or the varieties of sensorial accumulation, which phrase Dr Darwin has not explained suitably to my comprehension, it must be received as an axiom, that phthisis pulmonalis is present when the lungs are consuming.

* Diversions of Purley, vol. ii. by John Horne Tooke, Esq.

But beside the lesion of the structure or substance of the lungs, it must appear evident, that the name of the disease should imply that series of morbid changes of which such lesion is only a part; and, consequently, the commencement as well as the termination, with all the intervening succession of such morbid action as promoted the destruction of the substance of the lungs, should be comprehended in the denomination of phthisis pulmonalis.

In the history, for example, which we have considered in the commencement of this essay, do not the symptoms which precede those of distinct inflammatory action, as really indicate phthisis, as the symptoms of mortification do, which succeed? or, if not, in what part of the history could any one with propriety say, here only the affection is begun?* May we not, on these principles, safely assert, that every morbid action which commences in the lungs, whether in their nerves, vessels, membranes or any other part, and which, if not checked will terminate in the destruction of some portion of the lungs, is a part of that disease called phthisis pulmonalis?

* Ch. i. sect. 1. p. 1. &c.

If these reasons are valid, let the name phthisis pulmonalis signify not only the termination, but the beginning and every part of the progress of such morbid change as may ultimately destroy the structure of the lungs.

CHAPTER III.

PREDISPOSITION TO, AND CAUSES OF INFLAMMATORY PHTHISIS PULMONALIS.

SECTION I.

Predisposition to Phthisis Pulmonalis.

THAT the body is rendered obnoxious to phthisis by hereditary taint, the proofs are numerous, and that peculiar conformation is particularly assailable by it seems evident; but what is this peculiar conformation?

Predisponent causes are related to be, age, sex, beauty, fineness and delicacy of skin, softness of the muscles, high shoulders, long neck, narrow chest, tallness, plethora, &c. as well as many different diseases, particularly the cuticular and, in short, whatever enfeebles the body.

Being a year or two older or younger, being male or female, being delicate of skin, soft of muscle and tall with high shoulders

and long neck, seem to me not more connected with inflammation of the lungs, than with that of any other part or organ of the body. Nor will narrowness of the chest and plethora be found to have any more connexion with it than these.

If the lungs are adapted to the cavities which enclose them, how should they be liable to inflammation in consequence of the particular dimensions of these cavities? if the quantity of blood received is no greater than what the pulmonary vessels can easily and safely circulate, how should the lungs become inflamed in consequence of the mere size of the thorax?

Plethora, or the superabundance of blood, must affect the whole system equally, and cannot alone cause inflammation of one part more than another, not more in the lungs than in the fingers or toes, if all the parts of the system have equally the power of withstanding it.

But consumption is a disease * affecting the lungs particularly and locally, commencing in their substance, or envelopements, where is produced a series of changes

* Ch. ii. sect. 1. p. 41. &c. and sect. 3. p. 60.

which gradually disturb the functions, and ultimately destroy that organ; accordingly, some local predisposition must be in the lungs themselves, in order to account for their susceptibility of this disease.

Now when both the symptoms previously to death and appearances on dissection show, that this disease is an inflammation more or less extensively occupying the lungs; then whatever that state is which predisposes a part to inflammation, the same is the condition of the lungs which predisposes them to inflammatory consumption.

We may perhaps go a step farther, and endeavour to find some data to assist our judgment to determine in what this state really consists.

The symptoms of local inflammation are swelling, redness, tension, pain, heat. Swelling evidently arises from an unusual quantity of fluid distending the part, redness from an unusual quantity of blood. Why has this part, relatively to the neighbouring parts, received an unusually great proportion of fluid? Is it not, because its power of resisting the influx of that fluid is, from whatever cause, proportionally less? con-

sequently the predisposition to this pulmonary consumption appears to consist in a relative debility in the lungs, with regard to the powers of circulation.

There is nothing absurd in supposing, that the lungs may be often so deficient from their original structure, and such deficiency appears to me to be the only effect of mal-conformation which gives occasion to the disease.

Those means which enfeeble the general system, as bad food, excessive venery, vicissitudes of weather, cannot predispose to consumption of the lungs more than to that of any other viscus, the predisposition must have been antecedent to their agency. I may add, that from whatever causes, at whatever time of life and in whatever change of structure predisposition arises, in as far as the susceptibility of admitting too great a proportion of fluid is concerned, its nature must be the same.

SECTION II.

Causes of Phthisis Pulmonalis.

WHETHER phthisis, under any of its modifications, arises from contagion I shall not attempt to decide, as being a term which conveys to my mind no definite idea; but I have never had any reason to believe, that those visiting or attending the phthisical are particularly attacked by phthisis.

The causes, however, which excite inflammatory consumption of the lungs, are precisely of the same nature with those which excite inflammation in any other part or organ of the body, which it would be superfluous to enumerate here; but we may proceed, as we have begun, to review some of the hypothetical causes.

It has become fashionable to maintain, that tubercles of a scrofulous nature are the universal cause of pulmonary consumption, which is, in my opinion, just as rational as to maintain, that scrofulous swellings are the universal cause of inflammatory sores on the external surface of the body; but

this, in effect, is done, for any external sore of long duration is usually declared more or less to depend on a scrofulous taint. We poor Scots, it is affirmed, are all scrofulous by inheritance! How long will jargon continue to be the opprobrium of our science?

If, on the contrary, it is granted, that phthisis consists of a series of morbid change, which terminates in a lesion of the substance or structure of the lungs, scrofulous tumors or tubercles are not, on any occasion, causes of phthisis, but a part of the disease.

There is not, in fact, any more reason to believe, that tubercles of this nature are always formed in the lungs previously to the developement of the inflammatory process, than that scrofulous tumours are always the nidus of external inflammations, as rubeola, scarlatina, variola, erysipelas, or sores, in short, and abscesses of every description.

Even tubercles found in the lungs on dissection do not warrant us to conclude, that tumors preceded the inflammatory action, for when a part is inflamed the neighbouring glands swell in consequence. Most

persons who have the care of children must have noticed small tumors to appear behind the ears and along the neck, when the head is affected with those watery sores which so often trouble infancy. It is also a fact of daily observation, that when a tumor suppurates in the groin, the inguinal glands enlarge; but gradually, as the sore heals, the swelling of these glands subsides.

Dr Cullen thinks phthisis the effect of a certain indescribable acrimony! It is strange that Cullen, after having carried to extravagance the hypothetical spasms of Hoffman, and laboured to explode the humoral pathology with that of the vis medicatrix naturæ, should every where blend these doctrines with that of his favourite spasms. What can any one understand, in such circumstances, by the word acrimony? An empty sound! With other most respectable authors of every age, he enumerates among the causes, hæmoptysis, catarrh, asthma, suppuration of the lungs from pneumonia, and ulcerating tubercles. Now the first three, so far as this disease is concerned, are symptoms of it; and how is the last *cause*, viz. *ulceration of the lungs*,

to be distinguished from a part of the disease.*

In the confounding of the emaciation of the general system with the affections of the lungs, we shall probably perceive why the pneumoniæ and ulceration of the lungs have been deemed causes, instead of parts of the disease. †

Ossifications, calculous concretions and indurated glands, may sometimes excite inflammation of the lungs as extraneous substances. Even worms have been an exciting cause of phthisis.‡ All of which may perhaps be reckoned effects of the disease, characterizing a certain species of it, more properly than causes.

It is worthy of serious attention, that there is nothing which so frequently induces phthisical affections as the fires kept in our apartments during winter. A person quits an atmosphere cooled much below the freezing point, and places himself near a fire where the temperature of the air is raised much above that of our blood, whence

* First Lines, vol. i. p. 490, and 492.

† Ch. ii. sect. 3.

‡ Bonet. l. ii. sect. vii. obs. 86. in Appendice, p. 726 From Th. Bartholinus, Histor. Anat. 46. Cent. 1.

the greater number of sore throats, catarrhs and incipient consumptions: nor is the heat the only thing to be dreaded; the floating dust and various effluvia which necessarily proceed from fires, are unavoidably injurious even to the soundest lungs.

If a board of health were instituted, which had power to regulate the economy of buildings, it would contribute very much to the prevention of such diseases and to the preservation of very many valuable lives, if all the apartments, in which fires were not necessary for the preparation of food, were ordered to be heated by steam, and the temperature of them to be regulated by the thermometer; were this precaution, and others analogous, adopted, I hesitate not to predict, that the British islands would be as free from pulmonary consumption as any country in the world.

CHAPTER IV.

ON THE DIAGNOSIS OF PHTHISIS PULMONALIS.

SECTION I.

The chief Affections, which in their Symptoms resemble Phthisis Pulmonalis.

PHTHISIS Pulmonalis and ulceration of the lungs have in general been believed necessarily to co-exist, but according to the principle just assumed,* that the name phthisis pulmonalis must comprehend the whole series of morbid change, which terminates in the destruction of the organization and substance of the lungs, the ulcerative process is only a part of the disease; on the same principle also, contrary to custom, the pneumoniæ, so far as the lungs alone are concerned, must be considered as varieties of phthisis.

* Ch. ii. sect. 3.

It is not consistent with my design in this essay to attempt the delineation of the shades discriminative between this and the other affections with which it may be confounded.

I shall only take the liberty to suggest a few obstacles, which may occasionally obscure or even quite intercept our view of the disease; and shew, that the sputa and hectic fever may be deceitful guides to our judgment.

The function of respiration is disturbed by the morbid affections of so many parts, that it seemed very justly to Boerhaave almost impossible in many instances to distinguish what organ or part of the body was the principal aggressor.*

The parts, however, in which disease most readily creates ambiguity from influencing the function of the lungs, are the head, the passages into the lungs, the heart and its envelopements, the boundaries of the cavities containing the lungs, the abdominal viscera, particularly the liver.

It has frequently happened, that hydrocephalus and other affections of the brain

* Prælect. ad Institut. § 601.

have been the cause of those symptoms from which persons have been pronounced consumptive.

Willis, who points out the effects of irritation on the respiratory organs with more care than any preceding author, * relates the case of a young man affected with phthisis pulmonalis, who was obliged to keep his head inclined forward, because on his being placed in the supine posture or on inclining the head backward, the respiration became immediately so laborious and stertorous as to threaten instant suffocation. In his body the lungs were found to be almost totally scirrhous and in some parts ulcerated, while the ventricles of the brain contained much acrid, yellow serum; which was supposed to accumulate near the origin of the pulmonary nerves when the body was recumbent, and thus cause the difficult respiration.

But this explanation is not satisfactory, for it is not evident, that any fluid contained in the ventricles will accumulate posteriorly when the head is laid backward, and though it did, it could not press on the

* De Morb. Convul. c. v. p. 29.

origin of the pulmonary nerves without at the same time affecting those of equally important organs; besides, in some hydrocephalic persons, severe cough and dyspnœa have been excited by moving or raising the head in the least degree.

Experience has taught me, that the respiration is often so remarkably affected by irritation in the brain as to claim particular attention in our considering and treating the diseases of infants. I have seen several, that were for months deemed to be asthmatical, phthisical, affected with croop or hooping cough, in whom, after death, no mark of disease was perceived except effusion into the ventricles or cavity of the arachnoid coat.

Inflammatory affections of the larynx and trachea may very readily lead us into error with regard to the state of the lungs. Morgagni relates, that the lungs of a woman who was thought to have died of phthisis pulmonalis, were sound, and that her death was caused by a tumor containing puriform matter pressing on the posterior part of the larnyx.*

* Epist. xv. Art. 13.

What affections of the heart, &c. or of the parietes of the thorax may deceive us, it would be superfluous to enumerate. I recollect, that Bonetus records an instance of death from an abscess found in the fleshy part of the diaphragm.

None of the viscera, perhaps, the diseases of which impart disorder to the action of the lungs, have caused greater deception than the liver. Many persons have been pronounced phthisical, who only laboured under a hepatic affection; and the opposite mistake has probably been no less frequent.

There have been cases published of late, in which it is presumed, that the contents of an abscess of the liver had been discharged through the lungs in the sputa, but to the explanation given of these cases, there appear to be some very powerful objections.

In them are not detailed the unequivocal signs of an affection of the liver; that bile found in the sputa does not prove a communication to exist between the lungs and an abscess in the liver, since abscesses of the liver do not necessarily contain bile. Bilious vomiting or bilious sputa, have

been during a long succession of ages,* recognised as frequent occurrences in phthisis pulmonalis, though the liver is not remarked to be at the same time in a state of ulceration; that though the lungs and liver were, as they often are, synchronously in a state of ulceration,† yet there is nothing mentioned which could induce us to believe that the purulent matter escaped from the one through the other.

It is not mentioned, that after the persons got better they were affected with any difficulty of respiration, or any sense of tension on standing, as might have been expected if the liver, diaphragm and lungs adhered; and it seems quite unnecessary, if not extravagant, even when the lungs and liver are unequivocally diseased at the same time, to suppose, for the sake of explaining any appearances in the sputa, that the matters escape from the liver through the substance of the lungs.

These objections seem to be corroborated by the following facts: that the mat-

* Hippoc. Coac. Prænot. 392. sect. ii. Celsi, cap. vi. lib. ii.

† Bonet. l. ii. sect. x. obs. xxiii. vol. 1. p. 874. and sect. ix. obs. xxxvii. &c.

ter could only pass through the lungs when the abscess of the liver had perforated the diaphragm, and by adhesion formed a common cavity with them, so that the action of the respiratory muscles would force up the matter; and such an event must, from very obvious reasons, be exceedingly rare, and still more rarely followed by recovery.

That in the dissections of Morgagni there is not one well authenticated instance of such communication; nor in the sepulchretum of Bonetus, unless we consider of this kind the very anomalous appearances which presented themselves in the body of an asthmatical boy, who, if it may be believed, wanted the diaphragm, mediastinum and plura costalis, and whose lungs consisted only of one lobe continuous with the liver, and similar to it in substance.*

There occurred lately in this city an instance of death from an abscess, which had converted part of the liver and lungs into one common cavity; but the person had vomited or expectorated no purulent matter previously to the fatal event.

* L. i. sect. 1. additament. observ. iii. and vi. p. 558. from Diemerbroeck Anat. l. i. c. 13.

That Morgagni * relates one remarkable case, in which every thing seemed unequivocally to denote an affection of the liver, and which Valsalva in consequence declared to be an inflammatory affection of that organ; but on dissection all the abdominal viscera appeared sound, except the spleen, which was of nearly four times its usual magnitude; and the cavity of the thorax alone presented the ravages of fatal disease.

SECTION II.

Whether the Disease may be known from the Expectoration of Pus, &c.

IT is manifest from the writings of Hippocrates, that the various properties of the sputa of persons affected with disease had long attracted the attention of physicians. Aretæus also has described the various appearances of the sputa with much precision; † and it is probable, that even in his

* Epist. xx. Art. 30.

† De Caus. et Sig. Morb. Diuturn. l. i. c. 9.

time the sputa were examined by chemical analysis, for he very judiciously observes,* "That the sputa are of almost every colour and consistence, fetid or without smell; and the disease is not to be ascertained by subjecting the sputa to the action of fire, or commixture with water; the examination of the sputa must be accompanied with a rigorous attention to the appearance of the patient and the state of his health; for even one of the vulgar will pronounce him phthisical, who is pale and feeble, harassed with coughing and reduced by emaciation."

The similarity that appeared between the matters contained in the sputa and those discharged from sores on the external parts of the body, had suggested the opinion, that purulent sputa were an infallible proof of ulceration, and this opinion was erected into a scholastic dogma; but evidence accumulated that pus could be formed independently of ulceration, and there arose disputes, assertions and hypotheses innumerable, about the manner of its formation.

* Lib. Prim. de iisdem, cap. viii.

De Haen* having found pus in the bronchia where there were no signs of ulceration, maintained, that pus must be generated in the blood. In forming this opinion he might be a little deceived by observing no vestige of inflammation, as every surface that has been inflamed is not necessarily red or discolored after the vital influence has ceased to actuate it.

Cullen maintained, that pus is always the consequence of ulceration of the lungs, and that serum is converted into pus; which notion was rather inconsiderate, since he knew that serum was effused independently of ulceration.

At length however Dr Simpson and Mr John Hunter seem to have established, that pus is necessarily produced by all surfaces in a certain state of inflammation to which mucous membranes are particularly prone;† whence we may conclude, that the pus without ulceration was formed by the inflamed mucous membranes of the bronchia.

* Rat. Med. P. 12. c.vi. p. 214.

† Dr John Gordon, one of the presidents of the Royal Medical Society of Edinburgh, has given the best account that I have seen of the suppurative, as connected with the healing process, in his inaugural dissertation, published June 1805, entitled, *De Vulnere Naturæ Sanando.*

Accordingly phthisis pulmonalis is not to be distinguished from the common catarrh by the expectoration, but by the symptoms of an evident affection of the chest, for, if the inflammatory affection of the mucous membranes of the mouth and fauces extend along the ramifications of the bronchia, the complaint will be no other than a phthisical affection, since that affection of any part of the lungs is certainly phthisical, which, if not removed, will destroy in any degree their structure.*

What was that disease called suffocative catarrh, which raged epidemically in the 14th, 16th, 17th and 18th centuries, but a violent phthisis, since in it, though the exterior surface of the lungs and pleura remained entire,† the inflammation extended over the surface of the bronchia, during which an immensity of pus was there formed, and the patient often precipitantly hurried from the world?

Consumption of the lungs is not to be determined from the presence nor from the absence of purulent expectoration. Many

* Ch. ii. sect. 3.

† Morg. Ep. xiii. Art. 3, 4.

have been supposed from the expectoration to have ulcerated lungs, in whom, after death, no traces of such a state were found; others have died of ulcers, abscesses and sphacelation of the lungs, who expectorated no puriform matter.

We are informed of a girl, three years old, who had long laboured under a quartan fever without either cough or purulent expectoration, though after her death, which was sudden, the pleura was found to contain scarcely any thing more than purulent matter.*

Nor, in fine, is the disease to be precisely distinguished by any expectoration, but we must follow the precaution of Aretæus, and keep in view many circumstances, for as pus may be expectorated, when there is no ulceration, no abscess, no destruction of parts in the lungs; so, since ulcers of the lungs produce an equal variety of discharge with sores on the external surface of the body, the sputa may be of every kind, colour and consistence, while such ulceration exists.

* Bonet. vol. 1. l. ii. sect. 2. obs. xxxiii.

SECTION III.

Whether Hectic Fever is a decisive proof of the existence of Phthisis.

THE hectic fever of Cullen is improperly reckoned a necessary and decisive proof of the presence of phthisis pulmonalis; for many have died of consumed lungs who never laboured under such fever, and in a greater number of persons of sound lungs who were affected with suppurating tumors in the loins or other parts of the body, remote from the cavities of the breast, all its distinctive symptoms have been evinced.

This fever, admitting however some variety of symptoms, is indeed an almost decisive indication of the presence of ulceration somewhere, though not more in the lungs than in any other part of the body; wherefore the previous history of the complaint or certain concomitant marks must point out to us the seat of the ulcerated part.

Dr Cullen gained the highest consideration in the University of Edinburgh, whence

his influence has been diffused over the earth, therefore I have selected for animadversion from his writings, a few of those opinions which seemed particularly objectionable or dangerous; trusting that I shall ever be allowed to participate in this sentiment of Johnson, that "if there is any writer whose genius can embellish impropriety, and whose authority can make error venerable, his works are the proper objects of critical inquisition."*

* Rambler, No. 139.

CHAPTER V.

NOSOLOGICAL ARRANGEMENT.

SECTION I.

Errors in the Judgment of Authors with regard to the Place which they have assigned to Phthisis Pulmonalis in Nosological Arrangement.

FROM the nature and seat of this disease it seems entitled to the same class and order as the pneumoniæ, but why phthisis pulmonalis should be ranked by Dr Cullen among the hæmorhagiæ as a sequel of hæmoptysis, I do not think, that the Dr himself could have informed us. In hæmoptysis, blood is discharged from the lungs; in phthisis, pus. It was known as long ago as the days of Hippocrates, that blood is often discharged from the lungs when they are not affected with phthisis; and that, during phthisis, it is but an accidental occurrence; surely then, a circumstance, that may happen independently of phthisis, or may occasionally occur during

its progress, has no right to dictate its rank among diseases. Hæmoptysis and phthisis bear the same relation to each other that epistaxis does to ulceration of the Schneiderian membrane. Nor are the following definition, as it is called, and species, which Cullen has given of this disease, unexceptionable.

" Phthisis, corporis emaciatio et debilitas cum tussi, febre hectica, et plerumque expectoratione purulenta."

" Species sunt."

" Phthisis (incipiens) sine expectoratione puris."

" Phthisis (confirmata) cum expectoratione puris."

The disease has often proceeded a great length without emaciation, cough or his hectic fever, and all these symptoms have been present, and yet the lungs after death have been found entire.

His first species he denominates incipient, and distinguishes by being without purulent expectoration; now it sometimes happens, that a patient dies of the disease without purulent expectoration; consequently, he died of an incipient or unconfirmed phthisis.

His second species is the confirmed, when purulent expectoration is present; but that disease is, in every sense, confirmed, which no art nor remedy can remove, and this is too often the case with phthisis at every period of its course; sometimes, however, the disease has terminated favourably, after purulent expectoration supervened, consequently a person has recovered from a confirmed or irremediable phthisis!

It is not improper to observe, that what are called definitions of disease, are not in any sense definitions; they only consist of certain marks which indicate, that the disease exists, while the disease is the peculiar state of the body or the thing indicated; this reminds me of a definition which some philosophers have given of motion, "change of place," though change of place is but the sign of motion. Might not the word *indication* be here substituted for *definition?*

It is obvious however, that peculiar symptoms are the only proofs of the existence of a peculiar disease; and if we are allowed to select those, all of which are generally, and some of which are always present when

the lungs are affected with phthisis, perhaps the disease may be thus characterized.

Dolore thoracis, vel molestia quadam et prægressa et comitata, tabescit corpus infirmatum, principium versus ferè tussis accedit, postea cum vomitu febris, denique pus, etsi non semper, expûtum.

And as this is a disease which, for the most part, will spontaneously go through all the stages of local inflammation, viz. active inflammation, suppuration and gangrene; and as these stages are pretty distinctly marked by their symptoms and require very different treatment from one another, it would perhaps be conducive to practice to divide it into three stages, the first, second and third. The first, when the symptoms of progressive inflammation are present; the second, when the symptoms of the formation or existence of pus are present; the third, when the symptoms of gangrene or sphacelation are present.

Stadium primum, cum adsint signa inflammationis activæ; secundum suppurationis; tertium gangrænæ aut sphaceli.

Pinel in his philosophic nosography is not more happy than Cullen in his choice of a place for phthisis pulmonalis. In his

arrangement, pleuritis is a genus of the II. class or phlegmasiæ and of the second order, comprehending the inflammations of diaphanous membranes;* peripneumonia, of the third order comprehending inflammations of the cellular texture, of the glands and of the parenchyma of the viscera;† phthisis is a genus of the V. class or lymphatic diseases, in the second order or affections of lymphatic glands.‡

But there never was, I believe, an instance of pleuritis vera unaccompanied with some degree of peripneumonia, and in each not only diaphanous membranes and parenchyma, but the cellular texture, glands, lymphatics, blood vessels and nerves are all more or less involved. In short, the names pneumonia and peripneumonia are only applied to the more rapid and violent species of phthisis.

Medical science is very much indebted to Bichat and others, who have lately investigated the nature and affections of the various membranes. The knowledge thence derived, however, seems more useful for

* Tome i. p. 184. † Page 205.

‡ Tome ii. p. 244.

diagnosis, than for the basis of nosological arrangement.

Where is the membrane which is not supplied by blood vessels, lymphatics, nerves, and is not connected by cellular substance? what organ or part of the animal machine can become diseased without spreading its malignant influence to the neighbouring parts, besides the disturbance which it naturally creates in the general system?

It is not a modern observation, that in their healthy state membranes are nearly insensible, but when inflamed sensible to the highest degree. Seneca mentions this fact with much precision.

Maximi dolores consistunt in macerrimis corporis partibus: nervi articulique, et quidquid aliud exile est, acerrimè sævit, cùm in arcto vitia concepit.*

The same fact has, in the arrangement of inflammatory diseases, influenced the minds of most nosologists, but I am much inclined to agree with Cullen,† that the division of the phlegmasiæ into membranous and parenchymatous‡ is quite unsuitable, since

* Senecæ Epist. lxxiii.

† Nosolog. Phlegmas. Note.

‡ Sauv. ch. iii. Sagar. 605.

a nosological system cannot be founded on the distinct properties of those parts, the connexion, intermixture and mutual influence of which are not only not precisely distinguished, but perhaps not distinguishable.

There seems to be something fundamentally fictitious or artificial in the principles of most of our nosological arrangements: Cullen has given four classes; the first three comprehend diseases of the general system, the pyrexiæ or that of fevers; the neuroses or nervous diseases; the cachexiæ or diseases of depraved habit; the fourth class contains locales or local diseases, but these distinctions are only nominal, since in each class, there are fevers, nervous affections, depraved habit and even local diseases; among the diseases of the whole body toothach is given as an instance of fever; diabetes, as a nervous disease, and hydrocele as a depraved habit; but nostalgia, or the desire of seeing a place, is, wittily enough, *a local disease.*

As the principle of classification * Dr Darwin has chosen the proximate cause or the change in the system which immedi-

* Preface to Zoonomia, vol. iii.

ately precedes morbid action. His classes are likewise four, (p. 1.) 1st, diseases of irritation; 2d, of sensation; 3d, of volition; 4th, of association: but irritation is a sensation accompanied with some degree of anger; volition, is a sensation, with some wish; association, is a combination of sensations; all of these terms more or less involve the ideas of one another; in all of them, is implied the action of sense and of mind. Some degree of philological discrimination is even required to give each its distinct and appropriate place in speech; but in no acceptation connected with their radical, philosophical or common meaning, can they be made to denote the classes of disease. Indeed the proximate cause could only be the basis of a fanciful superstructure.

SECTION II.

General Observations on the Principles of Classification.

FOR scientific classification it is indispensably requisite to discover one general principle to which all the phenomena as it were

voluntarily submit. This has long been desired in nosology, and no one seems to have approached the fountain of animate nature so closely as Dr John Brown, author of the Elementa Medicinæ.

This great genius contemning the igneous, ethereal and other favourite principles, which were so many centuries the vivifying powers chosen by philosophers, endeavoured to deduce some general laws from the phenomena of life.

He selected a general truth which had been observed from the earliest ages by every man who contemplated the regions of the living world, but which before him, had never been applied as a fundamental principle according to which might be explained the phenomena of health and of disease.

This general truth is, that life, as discoverable in the phenomena of animals, is action; this action is the effect of what he denominates the excitability, which is a general susceptibility over the whole body to be excited by substances applied to it, and which may be, relatively to the functions of the animal, proper, excessive or defective.

He observed further, that the powers which excited the body, or, in his language, caused excitement, lost their effect by continued operation, proving the diminished excitability of the system; that these powers being withdrawn, the system became more excitable, proving the renewal of the excitability; and he applies these facts to the explanation of health and of disease in his works, to which I beg leave to refer.

I have said, that this general truth has been long perceived by philosophers, and indeed the latter observation also is recognisable not only in writings physical and moral, but even in common language, that such a thing has lost its efficacy, that we neglect, loathe and hate what we admired, desired and loved, are expressions universally familiar.

But the opinion, that the excitability is one undivided property equally diffused throughout the animal body and inseparable from it, which Brown esteems his particular discovery, or a tenet at least very similar, is attributed by Cicero to Dicæarchus in the following sentence: *Vimque omnem eam, quâ vel agamus quid,*

*vel sentiamus, in omnibus corporibus vivis æqualiter esse fusam, nec separabilem a corpore esse, quippe quæ nulla sit; nec sit quicquam, nisi corpus unum et simplex, ita figuratum ut temperatione naturæ vigeat et sentiat.**

To vindicate the pre-eminence of intellect, and to adorn human nature, there have, during the long series of past ages, arisen superior minds, whose penetration reached the recesses of nature, and whose powerful comprehension greatly embraced and anticipated the range of invention and discovery; there is abundant proof of this even in the mutilated literature that has survived the convulsion of nations and the wreck of empires. But the enlightened notions of the ancients necessarily remain unnoticed or not understood, until some of the moderns, who view the phenomena of nature in a similar manner, describe the ideas in modern language, and then the identity of conception is evident even through the veil of ancient expression.

In modern times, however, from the wider diffusion of knowledge, the students

* Cic. Tuscul. quæst. lib. i.

of nature are numerous in every civilized country, and by the improved method of experimenting, all the sciences advance rapidly toward perfection: instead of one or two philosophers in a fortunate age, confined to a favoured spot of country, there is now distributed over the inhabited world a great and noble fraternity of immortal names, who by united efforts are establishing, on the solid basis of a minute knowledge of the operations of nature, principles which were in the earlier times but dimly perceived by the intellectual eye of isolated genius.

I have mentioned above, that some general principle is a desideratum in nosology, that Brown devoted himself to the study of the animal economy in order to discover one, and that he seemed to have approached the simplicity of truth more nearly than any philosopher who had ever turned his attention to the subject.

Some, however, have of late ascribed to Professor Reil of Germany the merit of first conceiving and maintaining, that the living body is a united system, and that the laws of life are to be ascertained only by a strict

investigation and comparison of the actions of the animate being.

The principle indeed was maintained by the illustrious father of medicine,* and must be avowed by every physiologist and physician, for unless the body is a system the laws of which are discoverable by human industry, the study of the animal economy must be uninstructive, the practice of physic, imposture.

Thus, while I admire the principle, I cannot allow Reil the honour of originality in conceiving it, nor can I allow him this honour, either in the mode of investigation or in its particular application.

The mode of investigation is coeval with philosophy; it was enforced and exemplified by Lord Bacon, and, since his time, has been strictly followed by all accurate inquirers, both experimental and moral.

Brown was the first who strictly followed it in exploring and explaining the laws of animate nature: deeply impressed with a full conception of the principle on which it was founded, he uniformly considers the body to consist of mind and matter, mutually dependent on each other, and both on

* Hippoc. lib. de locis in homine, sec. 4.

external agents. The words in which he expresses his notion of the intimate and mutual dependence of the mind and body as constituted and existing in this world, evince both how decided his judgment was, and his critical skill in the language which he employed. There are three terms in the Latin language denoting the phenomena of vitality and of mind; *anima*, life simply; *animus*, life as connected with the mind and influenced by the passions; *mens*, the rational faculties; that there may be no ambiguity he uses all these three to imply properties distinctive of animate from dead matter: his own words are, "vocabulo corpus, tam corpus simpliciter dictum, quam etiam mente, animo vel anima præditum significatur, systema vulgo dictum."

The manner of studying the living system and of reasoning concerning it, which this principle would dictate, has been of too rare use in medical inquiry. It is a lamentable truth, that the science as generally received, consists of a number of seemingly incongruous facts, often explained by absurd, most frequently by fallacious, and fortunate would it have been for humanity, if never by pernicious hypotheses. Physi-

cians have endeavoured to support life, and yet have neglected to examine on what life depends. But now that the principle shines with the splendor of truth, ever propitious to the advancement of knowledge, under its influence the ingenious will explore the secrets of the animal economy, and we shall have a science built on an accurate acquaintance with the internal operations of the living body; thus physicians will not merely be the willing, but the able benefactors of mankind.

Have the philosophers, by simple experiments and attentive observations, unveiled the laws which regulate those luminous orbs decorating the vault of heaven, and station them at their relative distances, from each other inconceivably remote? have they calculated the retrocession of the signs, the polar nutation, the aberration of the fixed stars, the velocity of light darting through the immeasurable regions of space? and shall we despair of some grand principle being established, directing how to repair the waste of that frail machine of superlative beauty, the human body, which little fabric in importance to us far exceeds the boundless universe!

CHAPTER VI.

VIEW OF THE NATURE AND TREATMENT PRINCIPALLY OF PHTHISICAL AFFECTIONS NOT TO BE CONSIDERED AS INFLAMMATORY.

SECTION I.

Phthisical Affections independent of Inflammation, with the different Species of Phthisis Pulmonalis.

SYMPTOMS of inflammatory action, general or local, most frequently precede spontaneous morbid changes, either in the whole system or in any of its parts, and it seems almost universally supposed, that all morbid changes are the consequences of such action; but this notion is untenable, since morbid changes, both general and local, often commence and proceed imperceptibly.

The gradual failure of the capability and general functions of life are evident in the progress of old age, which itself, with fan-

ciful propriety, has been deemed a disease by the most profound moralists.

At any period of life also, though no inflammatory action has preceded, the vital energies of the body are observed to fail, the pulse becomes feeble and intermits, dark petechiæ and marks of general putrescence soon appear, and the patient rapidly sinks if not supported by the most powerful means.

The local morbid changes which take place, neither preceded nor accompanied by any symptom of local or general inflammation, are numerous and various. Such affections are of the most obstinate and dangerous nature; in them, the local evil indicates a general tendency or depraved habit; of which kind are ossifications, aneurisms, scrofulous, scirrhous and cancerous tumors.

Besides these local changes, others of a more immediately dangerous nature occur; any part of the living body may be seized by mortification from the deficiency of vital action or of the susceptibility of that action; as in the gangrene which often seizes the extremities of persons advanced in life and in putrid fevers.

It is a most interesting fact, never yet duly attended to nor appreciated, that portions of a nerve or its terminations, lose the power of supplying the prime agent of vital motion to a part and of conveying sensation thence to the sensorium; but, in this manner alone, can be explained the gradual waste of such organs as the lungs, unaccompanied with the sensations of heat and pain; and that, on some occasions, vitality abandons a part, while the general health and functions of mind and body are otherwise undisturbed, as has happened in hernia, but more frequently in the putrid throat, affected with which the person has not apprehended danger even within an hour of death.

The state of a part, however, when attacked by mortification is the same, by whatever means induced, whether by the action of inflammation or some other less alarming, though more insidious and destructive power.

Whatever is true with regard to the morbid affections of external parts, may also be affirmed of the internal. They are both subject to diseases of the same nature, variously modified, according to the struc-

ture and office of each: consequently, the general treatment and, as much as possible, the local also, are to be regulated on the same principle for the cure of the lungs, as for that of external parts similarly affected. We may on many occasions judge pretty correctly of the internal disease of the lungs from the habit and marks of disease on the exterior of the body.

Since now it appears, that such morbid action often commences in the substance of the lungs, as independently of inflammatory action entirely destroys them, it is consonant with truth to infer, that there is such a disease as phthisis pulmonalis independent of inflammation.

We have already taken notice of those species of consumption which Dr Cullen has described. To the remarks then made may here be added, that what he terms species are only different stages of the same affection, while a species should indicate some difference in the general features rather than in the degree or progress of morbid action.

Accordingly we are, by the facts which have been and shall immediately be detailed, perhaps authorized to say, that con-

sumption of the lungs or those morbid actions which destroy their structure or substance, are of three species.

The first, which has been above fully pointed out, commences in active inflammation, and proceeds through that series of change which such action induces. The treatment of which is to be fully considered afterward.

The second is independent of inflammation, and the consequence of diminished vitality.

The third, in which the two former are combined, begins in a state of torpor and becomes inflammatory.

SECTION II.

In which are chiefly considered the Symptoms and Treatment of the Second Species or that which is independent of Inflammation.

OF the first species we may just here observe, that the pneumoniæ as generally understood, and the formation of phlegmonous tumors and abscesses, are exam-

ples: in the first stage they must be treated by the most active antiphlogistic means. Astonishingly good effects, as was well known by the ancients,* are experienced from the most copious venæsection. But afterward the treatment must be guided according to the manner, whether resolution, effusion or suppuration, in which this stage has terminated.

The second species, which is the consequence of diminished vitality independent of inflammation, is exemplified in those in whom the disease was not well marked by any symptom, though after death the lungs were found to be almost quite destroyed.

Whenever there is progressive emaciation, a sense of weakness in the breast, inability to respire, frequent dyspnœa, sickness at stomach or vomiting and irregular bowels, though there is no very acute pain nor even any seemingly formidable symptom, we ought always to suspect the presence of an affection of this nature.

In such a state must be given nourishing diet, wine, bark and every thing that can maintain the frail movements of life.

* Hippoc. Epidem. Aret. de Morb. Acut. Curatione.

Any other treatment would be speedily destructive.

To this species may perhaps be referred the following affections, though they are rather anomalous.

The conversion of the substance of the lungs into an adipose inorganical substance as is recorded by Morgagni, resembling that of the lungs neither in consistence, colour nor structure:* this appearance may have depended on a secretion of fat in the cellular substance of the lungs, as sometimes happens in that of the scrotum.

Aneurisms, ossification which happens in the extreme vessels, in the parenchyma and in the bronchial rings: the presence of such a state of the lungs may perhaps be indicated by the rigidity of the thorax and laborious respiration which often infest old age.

Calculous concretions, which are formed not only in the bronchia, but in the cells where they terminate. Their existence in the lungs was known to Aristotle.†

We may sometimes learn, that they are present by their being brought up by cough-

* Epist. x. Art. 19.

† De Part. Animal. l. iii. c. 4.

ing. Persons, in whose lungs they are, have for the most part a sense of weight with pain in the breast and a hard dry cough, not relieved by any change of posture and aggravated while sitting.

When we know that such concretions are present, it would perhaps be useful to give such remedies as promote the increase of mucus in the bronchia, both to obviate and prevent irritation, and facilitate expectoration: for some persons have lived many years after expectorating very large and very hard calculi.*

In all these complaints there occur severe fits of asthma, palpitations, deliquia animi or faintings, and often the lipothymiæ or sudden deficiency of the powers of sensation and motion, while the judgment continues entire and the blood vessels perform their office.

Of such affections palliation is all that art can accomplish, and caution, both on the part of physician and patient, can never be more requisite. Motion by the exertion of ones own muscles, for reasons which will suggest themselves when we examine the

* Morg. Ep. xv. Art. 16. 17. 23.

effects of exercise, and every thing that may tend to excite powerfully or induce inflammation, must be very carefully guarded against. The patient must nevertheless have nutritious diet, nor can the food be digested without the assistance of stimulating cordial medicines. Vomiting cannot be induced but at the immediate risk of life from the rupture of blood vessels, and purging is not much less hazardous from the extreme exhaustion which may ensue, nor can we promise, that it will not be the commencement of unconquerable diarrhœa.

In order that the body may be nourished and not much excited, let the food consisting of mild animal soups and jellies, be given in small quantities almost every half hour; let the symptoms of disorder of the stomach be corrected by small doses of camphor; if diarrhœa is threatened, let small doses of opium be preferred to all other astringents; if constipation, let the powder of the rheum palmatum or rhubarb be taken in small doses along with the cinchona or peruvian bark; if the stools are dark and fetid, injections of beef-tea will be found of the greatest utility, whether the bowels are constipated or not; if the contents of

the intestinal canal are very bad, injections of the infusion of bark with kino are on no account to be omitted, to which, when the bowels are too easy, the tincture of opium must be added. In instances of the greatest debility, bathing with warm water holding some carbonat of ammonia in solution, produces the very best effects. The quantity of wine and nourishment given in the course of the day must always be in proportion to the evacuations, and the quantity of exhilarating medicines, in proportion to the debility, the languor, and the disturbance in the function of digestion.

SECTION III.

Phthisical Affections commencing without Inflammation.

THE third species, which commences in a certain morbid change, independently of inflammation, but in which inflammation is at length superadded, is most frequently the scrofulous. The presence of which may be known at the commence-

ment of pulmonary complaints, from the general habit of the individual or from that of his parents, and from glandular indurations in the neck, axillæ and inguina; but though this mark has long been thought* an important one, and is not to be neglected, yet it is not alone sufficient to determine the nature of the disease. We daily see persons covered with scrofulous sores externally, whose lungs are good; and glandular swellings are found after death in the lungs of many who had no exterior sign of scrofula; nor is it rare for scrufulous persons to die of pulmonary consumption, whose pulmonary lymphatics do not appear to have been chiefly in fault.

But if even without external proofs of scrofula, the person, when otherwise in good health, has long been affected with a teazing cough, dry or followed by slight mucous expectoration; if climbing or running readily induce dyspnœa; if these symptoms are aggravated in autumn, winter, spring, at which times scrofulous tumors swell, but are mitigated in summer when these tumors are known to diminish; if the

* Morton Physiolog. l. iii. c. 1.

symptoms are relieved by remaining in a warm apartment and suddenly induced by exposure to cold air; if they are made worse by low diet or much aggravated by the use of strong drink; we shall seldom err in supposing the affection to be of a scrofulous nature.

When we have reason to believe, that the complaint originates in tubercles of a scrofulous nature, it is necessary to have in remembrance the changes which scrofulous tumors undergo, and how they may be influenced by the state of the system. They do not commence when the system is in a vigorous state, but, on the contrary, when it is ill nourished and exposed to moisture or vicissitude of temperature. Under these circumstances the vessels of the glands having lost their necessary contractile power, are distended, indurated, obstructed, and form indolent, white, moveable tumors, from which the characteristics of inflammation, redness, heat, pain, are all absent.

These tumors originate and continue during a state of general debility; consequently, the symptoms, which they excite, must be exasperated by the debilitating plan of treatment. In this state it was, I imagine,

that Beddoes found nourishing diet and tonic remedies successful, but we should err grievously indeed, if we inferred, that every incipient phthisis should be similarly treated.

Tumors of a scrofulous nature in the lungs are often very numerous and minute, not larger than small seeds, and hence have been called tubercles, and these are most frequently implied in the phrase tubercular consumption, though tubercles of a very different kind are frequently found.* It must be obvious, that in such circumstances those means should be employed, which have been ascertained to be efficacious in the diminution of scrofulous tumors on any other part of the body.

I think, that I have ascertained, that the muriat of lime has a more powerful effect in removing indolent scrofulous tumors than any other substance used as a remedy; but that, when they become open sores, it is almost useless. This is a very manageable substance; the dose of it may be gra-

* Vide Baillie's Morb. Anat. In the Lond. Med. Communications there are some very ingenious and interesting observations on the state of tubercles in the lungs, as ascertained from dissection by Dr William Stark.

clammy or frothy matter. She began to take about five grains of the muriat of lime in solution twice a-day, and gradually increased the dose. The swellings soon diminished, and the pectoral complaint was at the same time much mitigated. At the end of six months, when she was taking nearly two drachms of the medicine a-day and seemed nearly well, from cold or some such cause all the pectoral symptoms recurred with greater violence then ever. Her appetite was much impaired, she coughed tremendously, suffered severe attacks of asthma, expectorated very copiously the same sort of matter that is above described, often vomited, and complained of headach and pain of chest; was sometimes hot, and sometimes shivered.

By the antiphlogistic treatment the violence of the symptoms was subdued; in about a fortnight after which the quantity of the muriat taken a-day was about three drachms, the pectoral symptoms were now quite removed, when the doses of the medicine seemed to cause squeamishness at stomach, and their quantity was therefore lessened.

She continues still, that is about one year from her commencing the use of the remedy, to take small doses of it; the visible tumors have signally decreased, and the signs of internal affection have quite disappeared.

It would give me infinite pleasure, if the utility of this remedy in such complaints were completely established.

It is of importance to remark, that recovery is much promoted during the cold months by confinement in an apartment the temperature of which is kept at about the 70° of Fahrenheit's thermometer.

The scrofulous tumors however, though they have not arisen from inflammation, become the seats, and, with regard to the neighbouring parts, the causes of the most dangerous inflammations. After being indolent and inert for many years, they become painful internally, inflame, suppurate and form sores of the most obstinate nature; at the same time they irritate not only the parts immediately surrounding them, but produce inflammatory action of the whole system. The treatment in such event is extremely perplexing. If we use antiphlogistic means to allay the inflam-

mation, we increase in the system the disposition to the disease which we wish to remove, and if we neglect them, we incur the risk of the life of the patient.

But as the immediate risk of life is chiefly to be dreaded, we must first employ antiphlogistic means to allay the inflammation, and afterward endeavour to obviate the debility thence induced, and prevent any bad consequences of it by nourishing diet and such regimen as will promote and maintain the activity, energy and strength of the system, which method has often succeeded to a degree that astonished me.

In instances of general debility the lungs become œdematous, and the water thus collected produces inflammation and ulceration of their substance, and this is another change not uncommon at certain periods of life, which precedes the inflammatory symptoms of phthisis, but which has been almost entirely overlooked, or not perceived by physicians.

This form of the complaint is to be fully examined in a separate work, wherefore I shall just mention here, that it is most successfully treated by diuretics and nourishing diet.

Both men and women about the age of puberty, or during the first two or three years which succeed, are very liable to pulmonary complaints, accompanied with the utmost languor and most alarming debility; the males most frequently from excess of indulgence: in each, the affection of the lungs and the general debility will be best treated by nourishing diet and tonic remedies, none of which are to be preferred to the digitalis properly administered.

When one considers how complex, how various the pulmonary affections are, how different in nature from one another, and the great danger incurred, if the treatment is not scrupulously adapted to the peculiarity of the complaint, one does not know, whether most to admire the courage, or wonder at the folly of those who commit their lives to the hazard of an empirical prescription, to which Alexander the Great would have preferred even the suspected cup of his physician.*

Is there any thing more absurd, than that life, incomparably the most valuable

* Vide Quinti Curtii lib. iii. c. 6.

of all possessions, indeed that without which there is no possession, should be treated with less care and skill than any common article of furniture? we will not allow a foot-stool to be repaired but by the most expert joiner, while we entrust our lives to the rashness of empiricism.

CHAPTER VII.

TREATMENT OF THE FIRST STAGE.

SECTION I.

General Observations concerning the Treatment of Inflammatory Consumptions of the Lungs, from their commencement to their termination.

HAVING endeavoured to distinguish those morbid changes in the structure of the lungs, which are not to be reckoned of an inflammatory nature, nor treated as such; having found, that phthisis pulmonalis consists properly of three species, the inflammatory from the commencement, that which is independent of inflammation, and that in which inflammatory violence succeeds torpor, and having considered on what principle and in what manner the non-inflammatory phthisical affections are to be treated, some of which indeed seem to hold both science and art in derision,* we

* Ch. vi.

are, I trust, well prepared to investigate now precisely and distinctly the treatment of the inflammatory phthisis pulmonalis, which comprehends all the first species and the latter part of the third.

It has been already concluded* that this is a disease which, for the most part, will spontaneously go through all the stages of active inflammation, viz. active inflammation, suppuration, gangrene, which last, by the bye, is not a part but the sequel of active inflammation; that, as these stages are pretty distinctly marked by their symptoms and require very different treatment from one another, it seemed of practical utility to divide the disease into three stages.

Induced by these reasons, I ventured to divide inflammatory phthisis pulmonalis into three stages, thus individually characterized: the first stage, when the incipient symptoms of progressive inflammation are present; the second, when the symptoms of the formation or existence of pus are present; the third, when those of gangrene or sphacelation are present; and these constitute the basis on which we here

* Ch. v. sect. 1.

proceed to consider and point out the treatment of the inflammatory phthisis pulmonalis.

If the disease is not arrested in its progress, the first or inflammatory stage runs into the second or suppurative, and this into the third or that of gangrene and sphacelus.

The object of the physician is to prevent the first stage from running into the second, and this into the third. The particular phenomena of these stages are to be found in the history of the disease.

To detail minutely every thing that may be done to remove those symptoms preceding distinct inflammatory action which characterize incipient phthisis, is unnecessary, as the treatment only differs in degree from that in which distinct inflammatory action is present, it seems requisite however, to be aware of several circumstances besides those already stated, which must greatly influence our judgment, not only at the commencement, but during the whole course of the disease.

Of these none deserve greater attention than age, sex, hereditary disposition, im-

mediate habit of body, previous manner of life and duration of the complaint.

In those from birth to puberty, we must be anxiously attentive to discern how far the pulmonary complaint may depend on or be complicated with the usual diseases of infancy and childhood; from puberty to about forty years of age, powerful evacuations are most useful, and from the latter period every year increases the danger of them; persons who have passed their sixtieth year are in general most successfully treated by strengthening remedies, and in the most advanced stages of life, any other are seldom admissible.

Women neglect their bowels; for the greater number of whose complaints in their commencement the purgative plan, as proposed by Dr James Hamilton of the Royal Infirmary,* affords the most effectual cure; the pregnant bear the abstraction of blood to a much greater quantity, and are much more benefited by it than even men are; at the time of the final cessation of the menstrual discharges, copious and

* Observ. on the Utility and Administration of Purgative Medicines in several Diseases.

continued evacuation of any kind is hurtful, and a great loss of blood is certain destruction.

The knowledge of that particular form under which the disease has existed in the progenitors enables the judgment more early to decide of what species it is.

If the constitution is tainted with any other disease as scurvy or lues venerea, the remedies of approved utility in these affections are the fittest to remove the concomitant pulmonary.

When the pulmonary symptoms have succeeded the use of low diet, both the powerfully evacuating and highly stimulating plans of treatment are dangerous, each must be used sparingly and with great caution; to prohibit entirely also the use of strong liquor after the constitution has become accustomed to it, not only often aggravates the disease, but produces a state of the sensations that is almost insufferable, and a state of mind more to be dreaded than consumption with all its horrors; in persons of this description, venæsection is to be avoided if possible; to them, unusually great doses of cathartics are very useful, and their diet must be of the nutritious

kind; the robust, who are neither too abstemious nor intemperate, are the proper subjects for the most rigid antiphlogistic treatment.

We may suppose the disease to approach the nature of our third species or that which commences in a state of torpor, in proportion to its duration, and it is to be treated accordingly.

Flannel shirts are very useful during the incipient symptoms and the milder part of the first stage, but, during the activity of the fever, they are intolerable.

Emetics are to be administered with great caution, and unless during the incipient symptoms their use is scarcely to be permitted.

Meloe vesicatorius, sulphuric acid, laxatives, mucilages, &c. are to be employed occasionally during the disease.

There is an incalculably pernicious custom now prevalent, that of the administering of opium in some form or other, at every period of the disease; though in the commencement it may alleviate the cough, it certainly increases inflammatory action; and though it may occasionally, at an advanced period, dispose to sleep and arrest

the expectoration, yet it eventually produces the restlessness of aggravated fever, and increases the danger of suffocation from the accumulated sordes in the lungs. In short, nothing is more injudicious than the use of opium where inflammation is to be prevented or its activity to be diminished.

It is obvious indeed, that nothing is more absurd and dangerous than the indiscriminate use of any substance as a remedy, since the nature of every disease and the susceptibilities of constitution, are not only different in different individuals, but constantly vary in the same person. However familiar this truth may seem, it has too little influence in medical practice: a disease is distinguished by the general epithet pulmonary, and medicines of equally vague description are administered. If physicians not only knew the names of the remedies in common use, but were able to explain for what reasons and on what occasions certain means are to be selected as salutary or rejected as pernicious, it would contribute more to the extermination of quackery than the anathemata and denunciations or the authority of all the colleges of the world combined.

dually increased from five or six grains, three or four times a-day, to two drachms; during its administration no particular change of regimen is necessary, and I have never observed it produce any disagreeable effects, except of the slightest kind, after its use had been long continued, and the quantity of the dose had become very great. Six years ago, I observed with admiration its effects in a young lady, who was so disfigured by these swellings that the apex of her head was that of a cone resting on the whole superior or atlantal aspect of the trunk.*

During its use for six months the neck resumed its proper shape, and there scarcely remained an unusual enlargement of any gland, and since that time, I have never seen it administered in similar circumstances without producing the most beneficial effects.

This remedy, therefore, seems to offer itself with great propriety in the state of the lungs now under consideration.

* Dr Barclay's Nomenclature.—I do not think that the human body or even that of any other animal can be intelligibly described until this nomenclature be adopted; and had it been generally understood, I would not in this work have used any of the old terms.

I have tried it frequently, and think, that it has always proved eminently useful; but in none so conspicuously as in a gentleman about nineteen and in a girl of nine years of age.

With respect to the former, the glands, in the situations above mentioned, were very much enlarged from his infancy. The skin of his extremities was rough and divided by numberless fissures, whence a thin watery fluid was constantly discharged, and, to the symptoms of pulmonary affection above detailed, were added frequent attacks of hæmoptysis.

During the use of this muriat for several months, the skin healed, the glands diminished in size, the pectoral complaints were removed, and the strength of his body was at least apparently improved by it.

The young lady is of fair complexion and delicate skin; her countenance is uncommonly lively and mind acute; she had the glands of her neck in general somewhat, but the parotid and tonsillary enormously enlarged, the latter seemed almost entirely to fill the fauces. She had occasional attacks of dyspnœa, teazing cough and copious expectoration of transparent

SECTION II.

Treatment during the Inflammatory Symptoms which terminate in and accompany Suppuration.

THIS part of the first or inflammatory stage requires every part of the antiphlogistic treatment, regulated according to the severity of the symptoms; here venæsection is often indispensably necessary, in whatever condition of the parts it originates, except that of œdema.

I am convinced, that even when the symptoms of the formation of pus have commenced, venæsection is often beneficial, and unquestionably when the fury of inflammatory action is not abated, for those means which diminish inflammatory action check the formation of pus; which is most carefully to be attended to in the affections of the lungs, where by diffusion in the cellular substance or obstructing the ingress of the air, any fluid may cause destruction of most important parts or even sudden death.

I first witnessed the decidedly good effects of this practice some years ago in a

man aged twenty-two, a mechanic. He was about six feet high, of florid complexion, athletic form, and a mind intelligent above those of his station. At the time when he called medical assistance, he complained of pain of chest and slight teazing cough; he could only lie on one side and was frequently squeamish. He had frequently for some years felt slight pains in his breast, and had been troubled, though not severely, with coughing; but these symptoms had been very severe for a few weeks. He had no oppression of breathing, but he was interrupted by a pain when he made a full inspiration; there was no expectoration; his bowels were rather costive. The bowels freely opened did not mitigate the symptoms. He was now attacked by slight shiverings; his countenance began to be pale, particularly round the mouth. His pulse was full and about ninety.

Now were abstracted by venæsection sixteen ounces of blood, on which was formed a thin buffy coat. Rest, quiet and moderate food were enjoined. In a few days after which he went to the country, where he lived sparingly, took moderate exercise, and in a few weeks completely recovered.

In this stage digitalis is very hurtful; it heightens inflammatory action, accelerates the formation of abscesses, and if it is exhibited with the usual intention of allaying inflammation, the consequences not only disappoint the practitioner but are signally disastrous to the patient.

Critically examining the writings on this subject, we shall discover the most satisfactory proofs of what I have affirmed; and referring to the observations and cases which are given in the second part of this work, for the complete demonstration of the same truth, it seems not improper to relate here the following case.

I was called to Mr —— June 23. 1806; his face was pale and extremely ghastly, his eyes sunk and of a beautiful pearly colour with the cornea lucid and pupils of a fine chesnut colour; his temples were collapsed, eye-lids and lips pale, teeth of a yellowish white, tongue foul and moist; the sweat run down his face; he vomited in my presence several quantities of mixed matter, dark and variegated with yellow and red. He was emaciated to the last degree, the bones of the trunk and extremities were not only wasted, but felt as if nothing soft

intervened. All the body was wet with copious sweat; his heart was felt beating forcibly and interruptedly through the chest; his pulse at the wrists, ankles and temples, was about seventy, feeble, easily compressible and intermittent. He thought himself dying, and his looks and words expressed resignation without any hope of life or dread of death.

He had no appetite, though what he swallowed remained on his stomach; he was rather costive; his stools were of natural colour; his urine limpid after depositing a white copious sediment. He slept little, and when he did, he was awakened by the cough and emission of the sputa.

He says, that he has cold shiverings, sickness and sweatings, every half hour, and very frequent alternations of heat and cold, which in their attack do not observe any particular time of the day. The attendants say, that he, in particular when sleeping, breathes loudly and laboriously, and has great flushing in the cheeks; at other times he breathes so mildly and is so ghastly, that they think, that he has imperceptibly expired. He cannot make a full inspiration, has a constant sense of weight, chiefly

in the middle of the breast, and often dreads suffocation from the defluxion. He can lie on either side with equal ease. He sometimes thinks himself oppressed when lying on his back; he seldom has headach; his senses are entire. Often the purulent sputa stop for some time, and then he becomes intolerably sick and faintish, cold shiverings succeeded by slight heat and copious renewal of the sputa, relieve him.

He has during his illness been attended by two eminent medical gentlemen of this city, but during these last eight days they have not thought it requisite to visit him daily; they just ordered him to use a little wine, or any thing that he would, or thought that he could take.

I was informed, that he had never been remarkably subject to catarrhal affections, that he was in general healthy, not robust, a diligent, sober, quiet man; he was naturally somewhat ruddy of complexion, about six feet high, rather narrow chested perhaps, but not particularly so; by trade a cabinet-maker; his parents are far advanced in life, and healthy.

He knows no cause for his complaint, unless it were a stress from attempting,

about nine months ago, to lift something that was very heavy; at least he does not recollect, that any thing was the matter with him previously; and he has never been well since. He has been confined to bed for six months, during which time he had severe continued pain in the middle of the chest, hard, dry, painful cough, no cold shiverings but continual heat; felt severe beatings or throbbings in his chest, head and temples, and often in the arms and legs; often thought, that his heart would force itself through his sides. He loathed all food; frequently vomited; his belly was in general bound; he had frequent headachs, which were sometimes attended with delirium; he slept little, or believed so, and was never refreshed by it; he could hardly inspire on account of the pain, which gradually increased, and was attended with great, and sometimes, particularly of late, with, as it were, a burning heat and throbbing in the seat of the pain. His urine was high coloured, and deposited a red sediment. This pain, heat and throbbing became about a fortnight ago excruciating, when for the first time he was seized with the most distressing sickness accompanied with severe

cold shivering, followed by a very copious discharge by the mouth of variously coloured, ill-smelled and horribly disgusting stuff as he said, and since that time he has continued as above described.

CHAPTER VIII.

TREATMENT OF THE SECOND OR SUPPURATIVE STAGE.

SECTION I.

Treatment according to the Different Appearances of the Sputa.

THE second or suppurative stage, as is implied in the name, commences with the generation of pus, which occurrence is indicated by the symptoms detailed in the history of the disease, even though, as frequently happens, they are succeeded by no purulent sputa. The management of this stage requires more skill, caution, prudence and scientific discrimination, than that of any period of this, or perhaps of any other disease.

The sores of the lungs, as has been anticipated, may have all the different characters of sores on the external parts of the body; the scrofulous, the scorbutic, the

scyphilitic, the erythematic, the phlegmonous, encysted, cancerous; they may be superficial or deep seated; small or extensive; they may be slow or rapid in their morbid changes; they may be of the active inflammatory, or of the putrid kind.

It is of the utmost consequence, that these varieties be accurately distinguished, as they must regulate our treatment and our hopes of cure.

To judge concerning the nature of the sores, it is particularly necessary to know the state of the constitution, the affections under which the patient has laboured, and those to which he is liable. The violence or mildness of the symptoms, their progress and changes, will often enable us to form a pretty accurate opinion with regard to most of the other circumstances.

There is another index, most frequently present, which points out with much precision the condition and tendency of the sores, and therefore has always claimed attention. Aretæus thus judiciously appreciates it:*

"The white, inodorous, globular, smooth and easily expectorated sputa, are salutary;

* L. i. c. 9. De Causis et Signis Morb. Diuturn.

the pale, bilious and mixed, are bad, but the worst of all are the livid and black, which indicate phagedænic ulceration and gangrene."

We have formerly given our reasons for not deeming the matter expectorated so valuable a diagnostic mark as it had generally been believed to be; but as merit has the only just claim to preferment, we shall now invest it with a much higher office, that of assisting our prognosis and directing our treatment.

When sores are in that state of action during which they heal, the matter discharged from them assumes the form of laudable pus, the formation of which requires an action of the system a very little stronger than that of usual health, to maintain which, generous diet with wine, bark, &c. and gentle exercise are necessary, which are to be diminished if inflammatory symptoms tend to violence, and all but the exercise to be augmented if the actions of the system languish.

When the suppurative process begins to degenerate, and instead of resembling laudable pus, the sputa are thin, viscid and transparent; our remedies must be of the

more active kind, and their use must be persevered in, and their doses increased in proportion to the difficulty which we experience in rousing the vital functions to the requisite activity, and even though a considerable degree of fever should be excited, we must persevere until the sputa assume the proper form.

We are not to be deterred, by the notions, that the access of air to the wounded surfaces, or the continual motion of the lungs, frustrate all attempts to induce a cure, for ulcers often form in the lungs and heal spontaneously; in fine, what is chiefly to be dreaded, is the spreading and degeneracy of the ulceration. When the sputa become sanious, ill coloured, fetid and putrid, the most powerful remedies are to be employed with the utmost activity; wine, cinchona, camphor, &c. in profusion; digitalis with circumspection; and all of them to be alternated with substances of similar quality: and if any substances are found which can be inhaled with safety, to promote the activity and healthy granulation in the diseased surfaces, they certainly ought to be prescribed.

The first time that I treated any one strictly according to the method here described, was in the following case:

M—— æt. 19. August 1804.

This gentleman was of slender shape and tall; of very acute mind, and very irascible. Naturally indolent, but capable of very great activity and exertion. One of his testes never descended into the scrotum, but remained in the groin, and latterly gave him much uneasiness. He had from infancy a slight cough, aggravated by bodily exercise; he was fair haired, light eyed and well complexioned.

He went to London and was engaged in a counting-house, where, from fatigue, exposure to cold, and the irritation of the testicle, he became very unwell, and returned to Scotland, labouring under phthisis pulmonalis in the puriform stage; he was inexpressibly feeble and emaciated, and evinced all the ordinary symptoms of ulcerative fever; his pulse about 130; in which state he was when I visited him in the country at his father's house. The father was one of my best friends; the son and myself were on terms of the strictest intimacy. I esteemed him highly for his superior ge-

nius, and was very much grieved to see him rapidly approaching to that awful change, that cessation of intercourse with this world, which none of mortal race can view with indifference. Some time before this, I had turned my mind seriously to pulmonary affections, and was satisfied as to the principles, that should regulate the medical treatment of phthisis in the different forms which it assumes during its progress. I thought my time on this occasion could not be spent more usefully than by attending to the health of my friend. To the circumstances above mentioned, we may add, that he took food in small quantity and seldom, and shortly after eating he was harassed by cardialgia, flatulence, vomiting, or severe tormina; so that the taking of food was a terror to him. His sputa were copious and ill coloured; his cough very distressing during sleep, which was always short and not sound; his breathing was very noisy, and he frequently moaned. In this state, nourishing diet, gentle exercise, agreeable conversation, seemed the best means that could be employed. It was necessary at the same time to raise and maintain such a state of action in the sys-

tem as would induce a healthy state of the sores of the lungs. I made him take a little white wine at mid-day and a short walk; at dinner a little animal food, and after it a little ardent spirits, which completely prevented the cardialgia, tormina, &c. I walked with him, commenced, and carried on such conversation as seemed most agreeable to him, and watched him carefully while he took food, examining on all these occasions the pulse and other indications, and was also very attentive to the sputa and other evacuations. I was extremely happy to observe him speedily acquire cheerfulness, and improve in health and vigor. The pulse became slower and more regular; the affections of his bowels scarcely gave him any uneasiness; the sputa began to assume the form of laudable pus, and to diminish in quantity; the morning sweats were far less copious and debilitating. At the end of eight days, he walked with me three miles to the house of a relation, was indeed somewhat fatigued, but this went off in a short time, and he took food heartily. Next morning we walked two miles and a half to the house of an acquaintance; he was considerably

fatigued, was paler, and to his sensations feebler than he had been for three or four days. A glass of wine however, renewed his strength.

I here continued my plan of regimen. I lay in the same bed, and observed him carefully during the night; he slept now tolerably well without the assistance of the anodyne draughts, which he had formerly been in the habit of taking; his breathing became less noisy, and his involuntary plaintive expressions very rare. We remained here together about four weeks, and during the last week the cough gave him no uneasiness; the pulse was about 90; and from food, change of posture, or exercise, observed nearly the same changes as that of a person in health; and he walked, run, rode, or went a-shooting, from morning to night, without inconvenience. But as he exercised and exposed himself now with too little caution, I admonished him to be more cautious; and on quitting him to return to my studies in town, I was highly gratified with the thought, that means had been found to rescue from death this most valuable youth: but the event was far otherwise; the regimen was discontinued,

and all the train of symptoms above described returned with accumulated severity.

I would not conclude however, that the discontinuance of the treatment which I had employed, was the occasion of the fatal event in the month of January following; it must be obvious with how little certainty we can predict, that the event will be favourable or unfavourable in any case of pulmonary complaint, however mild or desperate it may appear.*

SECTION II.

Treatment as regulated by the various Phenomena of the Fever which attends Ulceration.

WE have given the general plan of treatment, as indicated by the state of the sores; but the administration and regimen must be regulated by many occurrences, and none are to be more regarded than the varieties in the state of the body and mind, which are observed to happen during the fever which accompanies this stage of the disease.

* Ch. i. sect. v.

Many persons, particularly at the beginning of this stage, are pretty strong, and the fever has very little either of exacerbation or remission. It is best for them to use generous diet in moderation, gentle exercise, riding on horseback, a voyage, swinging in the open air in a seat so constructed as to support the body without much muscular exertion; change of climate, agreeable conversation, &c.

The use of food in a liquid form alone is improper, because thus the muscles of vermicular motion are deprived of the only power that can resist their contraction and regulate their movements, consequently the function of digestion must thus be but very imperfectly performed, though no other deficiency co-operated. Nay, from the disuse of solid food, the portions of the canal which ought to be largest, have been found of the size of the ilia.

When the mind of the patient is hypochondriacal, is too easily or unreasonably impressed with either joy or despair, we must not believe, that he is nervous, or, in other words, that his troubles are ideal, and require no medical attention. If we recollect, that the mind and body mutually in-

fluence each other, and that those muscles, which by their action, those eyes, which by the variety of their appearance, so truly declare the internal operation of the mind, are like all the parts of the body, moved by the nervous influence; there is as much reason for assistance when their actions are irregular, as there is when an arm or a leg is convulsed or paralysed; both equally indicate the irregular distribution of sensorial power.

For those in whom the exacerbations are distinct but mild, the treatment will as much as possible resemble that above described; in short, the similarity of treatment must be guided by the similarity of symptoms.

But in those whose exacerbations are severe, the varying state of the body and mind ought to be most carefully watched, and medicines and food to be administered accordingly.

If the pulse is feeble and the mind depressed, he should be encouraged by words, and receive wine and exhilarating medicines. When he becomes complacent, animal food should be given; if the eating is followed by cardialgia, nausea, gripes of

the bowels, or other symptoms of depraved digestion, a little brandy and water will often give immediate relief, and is always useful.

When the feet become œdematous, they are to be rubbed with camphorated oil and bandaged pretty tight with a roller of linen, morning and evening, which is indeed indispensably necessary, if the patient is able to walk or even sit. When aphthous sores invade the mouth and fauces, port wine containing the tincture of opium, or an infusion of bark containing a quantity of the same tincture, is a very useful local application: we have formerly considered what the treatment must be when the bowels are troubled and their contents vitiated.*

Circular cushions, hollow in the middle, should defend those parts of the body which must sustain its weight in bed, and when gangrenous sores form, the appropriate surgical means must not be neglected. It is extremely cruel, if not criminal, to overlook such sores because the patient may be thought irrecoverable; I am satisfied, that lives might have been preserved, had it not

* Ch. vi. sect. 2.

been for the neglect or mismanagement of these external evils.

If the pulse is irregular, languid and scarcely perceptible to the touch at the temples, wrists and ankles; if there are rigors, cold sweats, diarrhœa, sickness, vomiting with ghastly paleness of countenance, disgust of life and low delirium; if livid spots or petechiæ appear all over the surface of the body, then we must endeavour, by all the means which the medical science or art can suggest or employ, to intercept mortification and induce some degree of regularity in the functions of life. Here opium, wine, ether, camphor, musk, &c. are to be administered; and the repetition of the doses, and their quantity, to be regulated by the effects produced on the arterial system, and the sensations of the wretched sufferer.

It seems to have been the opinion of the ancients, * that when the symptoms, of what is now called hectic fever, were present, that certain parts were affected in some degree with sphacelation; and this opinion of theirs is founded in truth, and

* Aretæi l. i. c. 8. De Morbis Diuturnis.

is the result of accurate observation; it derives confirmation both from the symptoms and the method of cure.

It is very fortunate, that diminishing the severity of the cold stage, and supporting the strength in the manner just described, greatly prevents the danger and severity of the febrile exacerbation.

The fever which attends ulceration of the lungs, is not of one uniform kind; it is in one remittent, in another intermittent, in a third typhoid; it is various, in short, according to the different conditions of the system.

In proportion as the person becomes cheerful and lively, and his pulse regular, this treatment must be relaxed; if he continue in this state, weak beef-tea, wine diluted with water, &c. are to be given. If the face become flushed, the lips dry, and their cuticle like oiled silk, and the skin dry and hot, acidulous drinks are to be administered; cold vinegar and water mixed remove that most disagreeable heat which so often invades the extremities; the acute pain which often accompanies their spasmodic affections is greatly alleviated by bathing them with brandy; if the skin become

very hot, cheeks florid, mind morbidly active, or if it indicate a degree of delirium with much inquietude, the tepid bath or even gently wetting the shaved head and surface of the trunk with a spunge dipped in vinegar and water, are very beneficial. I have even seen the action of the cold bath administered in such circumstances, followed by much relief and sound sleep. If phrenitis seem to be threatened, vesicatories must be applied to the head.

The sweat must be wiped off assiduously by which the vessels of the skin partly recover their tone, and thus we prevent the very bad effects of the cooling perspiration, and in a great degree, the alarming effects of exhaustion, which are so apt to appear in the remission.

SECTION III.

Account and Explanation of the Effects of Posture on the Heart and Arteries, in Health and Disease, and the Reason assigned why a certain Position is easiest for the Body of an enfeebled Person.

EVERY man or animal conscious of sensation, that ever existed, must have experienced, that, when debilitated or labouring under disease, one posture of body was more agreeable or tolerable than another. I do not know however, that the effects of posture alone on the vital actions in health and disease have ever been duly investigated, but it is indubitable, that if a certain position of body is more conducive than another to our comfort when we are suffering from disease, that it is worthy of our attention; and that such a position may be ascertained, the following considerations induce me to believe.

Some years ago I happened to count my pulse when I was standing erect, and while I still held my finger above the pulsating

vessel I stooped to look at something lying on a table before me, and immediately observed the pulsations to become slower. I repeated this experiment often, and always with the same result; I found, that the pulse was in general about ten beats more, when I stood, than when I lay, and that when I sat, it maintained a medium number.

An immense number of observations made on this subject in various circumstances, proves, that the rule is invariable; and further, when the pulsations are increased by any means to an unusual number, that then the diminution on change of posture, is most conspicuous. When the pulse is raised by food and strong drink, it will, on our lying down, diminish in number by twenty or thirty beats per minute; the pulse at the same time becomes much stronger; we feel, or even think we hear the carotid arteries pulsating; we feel also the movements of the heart and of the abdominal aorta; we are sensible of fulness in the head; and, if the head is as low as the rest of the body, vertigo and a degree of stupor are very common occurrences. It does not seem improbable, that the more free supply

of blood to the brain in the horizontal posture is a chief cause of this position being more favourable to sleep than any other.

The pulsations of persons much debilitated, and in a febrile state, are remarkably increased by change of posture; the heart flutters, the pulse becomes of extraordinary frequency, even on assuming or attempting to assume the sitting posture. A remark of this kind is given by Dr Beddoes on the authority of another, who observed, that in a patient taking digitalis, there was a wonderful increase of pulsations when he sat up, but such is a common occurrence in cases of debility, and if it were consistent with my present design, to take notice of such effects in diseases, I could recount many instances where not only such increase of pulsations evinced itself, but where fainting, apoplexy, convulsions, were the consequence of the smallest attempt to raise the body.

On close comparison, the effects of posture should be reckoned of the same nature with those of the exertion of our voluntary muscles in moving the body, as in walking, &c. for the increase in the number of the pulsations by change of posture, is in pro-

portion to the number and force of the muscles by the action of which the change is made, or the new position maintained; consequently the pulsations are fewest when the action of fewest muscles is required, viz. when a man is in the horizontal posture: from this posture, if we proceed to those of sitting and standing, and thence to walking, running, or any other variety of exercise in which the action of ones own muscles is required, we shall find the rule completely established, and the number of the pulsations and respirations increase together.

The weaker any one is, the greater is the acceleration or retardation of pulse by change of posture; thus change of posture may be a measure of debility.

Since there is in the standing and sitting postures a number of muscles in a state of action from which alone some degree of fatigue may ensue, it appears, that the easiest position, as being that in which the system is least excited, is the horizontal; but even this position must be under certain limitations, for it has been found, that, if the head is no more elevated than the rest of the body, giddiness and vertigo very soon super-

vene, particularly after taking food. This, I think, may be easily explained, for the carotid arteries proceed upward nearly in a straight direction, and accordingly the blood moves in them with an impetus less counteracted by the flexion of vessels than in most of the branches sent off from the aorta; but when the head is a little elevated, gravity in some measure impedes this flow; so it should seem, and if I mistake not, experience has confirmed, that the patient lies most easily and safely as it were on a gently inclined plane, the head being the most elevated part of the body.*

From knowing the great power of muscular motion in accelerating the movements of the heart, and those of the vessels dependent on it, we shall likewise be enabled to account for that dyspnœa and redness of the face which running and climbing always induce. The action of the loco-motive muscles while it increases the velocity, impedes the efflux of the blood from the interior of the body; during running and climbing therefore the blood vessels of the

* Celsi l. iv. c. 4. Caput hujus quoque cubantis sublime esse debet.

lungs become turgid, and by a natural consequence those of the head, but the lungs must be more forcibly affected by climbing than running, for this reason, that, when we ascend an eminence, the body is incurvated forward, the abdominal parietes press the viscera in such a manner as almost entirely to resist the descent of the diaphragm; and the contraction of the exterior thoracic muscles while the pelvis is the fixed point, opposes the elevation of the ribs; thus the motions of respiration are almost completely arrested, the circulating fluids accumulate in the lungs, and the difficulty of breathing becomes very distressing.

Not aware of this necessary physiological event, philosophers have erroneously imagined, that animals could scarcely breathe on the tops of high mountains because of the rarity of the atmosphere.

In fine, that the increase in the number of pulsations is in proportion to the number and force of the acting muscles, affords the link which unites change of posture with every variety of bodily exercise, in as far as regards the effects of muscular action on the circulating systems; a thing, as often happens to the more obvious oc-

currences, the simplicity, plainness and vulgarity of which have concealed from the serious attention of the wise. It should ever be remembered however, that the most common events, which obtrude themselves on us, are the only guides to the innermost recesses and occult operations of nature: the motion of a stone thrown from the hand explains how the heavenly bodies are arranged throughout the universe.

SECTION IV.

What Kinds of Exercise, and when Sea Air and Change of Climate are to be advised.

FURTHER experiments on every kind of exercise by land and sea have demonstrated to me, that exercise by the action of ones own muscles raises ones pulse speedily and to a greater frequency than any power that acts on the body; that riding on horseback raises the pulse in proportion to the exertion of the rider; that being drawn in a curricle or wheeled carriage even very briskly has but a very moderate influence;

" that swinging raises the pulse in proportion to the exertion which the person is under the necessity of making to maintain his seat; and I have found the pulsations to be increased by thirty in the minute, by the motion of a swing of the best construction; besides, the sickness which such motion induces in those unaccustomed to it, is a great objection.

" It is evident however, that the least fatiguing mode of exercise must be prescribed to the feeblest.

" The first time that I observed the decided utility of sailing as a remedy in this stage of phthisis, was about twelve years ago, in the case of a young gentleman, who by intemperance and dissipation brought pulmonary consumption on himself. He had the first medical advice in Britain, particularly that of Dr Monro, senior, and Mr Benjamin Bell.

After purulent expectoration came on he procured a sloop, and having sailed along the coast a few months, he seemed to have entirely recovered.

Self subjugation is the most difficult of all enterprises: this gentleman, even under the dread of death, could not abstain from

his former habits; the disease returned with greater violence, and the consequences were fatal.

It has been found, that, if one is not seized with sea sickness, to which the phthisical are less liable than others, sailing exposed to the sea air does not perceptibly diminish nor increase the number of pulsations. Sailing then is useful by some other effects than those on the heart and arteries: the temperature at sea is equable; the body in the vessel is kept perpetually in some degree of motion without fatigue; the air being cool checks febrile heat, and being impregnated with saline particles, reaches the lungs, and acts as a gentle stimulus to the wounded surfaces of the bronchos and its ramifications, and thus promotes the healing process. Now as for the healing of suppurating sores an action of the system is required not much stronger than the healthy, and as equability of temperature also and slight stimulation are necessary to keep up a steady degree of action in the wounded surface, and coolness is at the same time required to check febrile heat, are not these ends well accomplished by an excursion on sea? and would they not

be equally so, by riding in a curricle on the shore?

Sydenham highly extols gestation on horseback; Dr Carmichael Smyth, swinging; but these modes of exercise are not different in principle from each other.

I shall not minutely inquire why it has been supposed, that sailing and swinging diminish the velocity of the circulation of the blood; but this I know, that sitting in a swing does not diminish the number of pulsations more than sitting on a chair, nor does sitting in a vessel at sea diminish them more than sitting on a stone on the beach, or, *cæteris paribus*, on a seat in any other place. Of this I have repeatedly satisfied myself by comparative observation, but if a person is walking or standing on the shore when his pulse is counted, and then go on board and sit down, and have it counted again, the pulse will diminish in number of beats proportionally to the debility of the constitution; and the event will be precisely similar, if the pulse be counted when the person is walking in a garden, and next when seated on a sling; and in neither case different from what might have been observed, when he walked in his room and sat

down on a chair. If a person labouring under ulcerative fever be exposed to the sea air, the pulsations will be affected precisely as they would be by air equally cold in any other place; but, as Galen remarked, who seems to have known the effects of cold affusion as accurately as the late ingenious Dr Currie of Liverpool, the velocity of pulse in this fever is not diminished by the surface of the body being cooled as in other fevers;* if a vomica burst in the lungs, the matter escape, and the sore heal, the pulse will resume its healthy number, whether a ship, a swing, or his usual abode have contained the patient.

From time immemorial the utility in pulmonary complaints, of change of climate, travelling by sea and land, sea air, and bathing, have all been well known from innumerable instances, yet unfortunately these means were adopted improperly, because they were advised indiscriminately,† and for the same reason have been praised or condemned by physicians, just

* De Different. Febrium, l. i. c. 13.

† Utilis etiam in omni tussi est peregrinatio, navigatio longa, loca maritima, natationes. Celsi l. iv. c. 4.

as they chanced to be used in advantageous circumstances, or the contrary. Uniformity of temperature, steadiness of weather and pure air are always to be preferred.

For scrofulous habits, of which we have already considered the nature and treatment,* the warmer climates are salutary, the sea air sometimes hurtful; but, during incipient inflammatory affection of the lungs, both the stimulating atmosphere of the sea and its coolness are bad, now a moderate temperature is chiefly desirable: in the inflammatory stage, bodily exercise, the stimulating atmosphere of the sea, tropical heat, are all to be avoided, the treatment must resemble that of the inflammatory stage, above described:† in the suppurative stage accompanied with the ulcerative fever, nothing is preferable to sailing and sea air, hot climates and hot seasons are pernicious; but though there are puriform sputa, acceleration of pulse, and other evident symptoms of ulceration, yet if the countenance is uniformly pale, the mind depressed, the extremities rather in general cold; if the patient complains not of pain,

* Ch. vi. sect. 2. † Ch. vii.

but of oppression in the breast and frequent attacks of dyspnœa; if, in fine, there are no exacerbations of fever, the sea air is only useful in the hot seasons, and a warm climate will be of almost certain advantage: cold bathing is in every stage, for the most part a precarious remedy; the warm bath is most generally useful.

Let it be impressed on our minds then, with how much circumspection voyages and changes of climate ought to be advised. An abode in the island of Madeira may be no more useful in some instances of phthisis, than an abode in Iceland would be for an old man with mortified limbs.

SECTION V.

Utility of inhaling certain Substances to promote the healing of Ulceration in the Lungs.

WHEN chemistry, improved by the ever memorable discovery of the different gases, began to elucidate the nature of those changes essential to life, which the common air and blood undergo by their mutual and

reciprocal influence in the lungs, some men of enterprising minds conceived, that the breathing of the constituents of the air, in proportions different from those in which it was contained in the atmosphere, might be a mean of preventing or curing disease, but further investigation seems to have shown, that wise and provident nature has mingled the ingredients of the atmosphere with that admirable precision of relative quantity, which renders it the unique, the only compound adapted to preserve and to maintain animal existence.

I am inclined to suppose, that if the inhalation of stimulating gases has promoted convalescence, its effect is rather to be attributed to their local agency on the surfaces of the bronchia, than to any modification occasioned by them in the changes of the blood.

Impressed with the idea above mentioned, of the operation of the air containing some of the saline particles of the ocean, and this idea being confirmed in my mind by what we daily observe in the application of stimulating substances to sores on the exterior of the body, it appeared to me, that the common inhalation of the steams

of vinegar and water, or of air impregnated with ether, which affords such immediate relief, and seems in the event so useful in many instances of dyspnœa from a phthisical state of the lungs, acted in a similar manner; and that hence we had every reason to conjecture, that the dissemination of stimulating effluvia in the appartments of the phthisical, when the sputa indicated the sores to be in a degenerating or depraved condition, would be highly serviceable not only to clean the sores, promote the healing action of their surfaces, and prevent or diminish the acrimony and putrescence of morbid matters there collected or secreted, but to invigorate the expectoration of such matters, as lodging in the bronchia, obstruct the ingress of the air and spread the devastation.

It has indeed been observed long ago, that an atmosphere impregnated with stimulating fumes was serviceable to the phthisical; nay, the fumes of arsenic and sulphur were deemed a remedy of very great efficacy in the most desperate cases of pulmonary ulceration.* This fact would have

* Thomæ Willis Pharmaceut. Rationalis, c. vi. sect. 1. p. 164.

been of great practical utility, had those circumstances of constitution or of disease been pointed out, in which alone such means ought to be employed.

The inhalation of air containing muriatic acid gas or ether has at my suggestion been for some years prescribed by others as well as myself with manifest advantage. The patient is conscious of much relief from it, and the salutary changes in the appearance of the sputa, which soon succeed, fully testify the utility of the practice.

I pursued this plan with steady attention in the case which I have partly related, to shew the effects of digitalis in the inflammatory or first stage of phthisis.

The symptoms of that case, the relation of which is now to be continued, clearly indicated, that a species of abscess had formed and burst in the lungs, the contents of which were now discharged by expectoration, and that the system was exhausted to the last degree.

The matter shewed, that the wounds were in a very bad condition. In order to promote the activity and energy of the system, I ordered one glass of port wine to be taken every second hour, and beef-tea to

be drank in the intervals. To open the bowels and procure sleep, I prescribed,

℞ Extracti hyosciami nigri,
Aloës Socot. ā. ʒi.
Pul. Cinnam. q. s. ut simul in massam probè subigantur
in partes xxiv. æquales dividendam.

Signetur—24 pills, two to be taken to-night, and one every night unless there shall have been two loose stools.

In order to stimulate the wounds in the lungs to co-operate with the internal remedies in promoting the healthy action of their surfaces, and the formation of healthy pus, I taught the woman attending how to disengage the fumes of muriatic acid gas in his apartment; and the smell of the acid was always to be kept up in the air of the room.

I ordered the sputa, the stools and urine to be kept till I saw them.

January 24. The patient looks better, sputa not quite so black, two pretty consistent dark coloured stools, much white sediment in the urine; he slept pretty well during the night; pulse 70, stronger and more regular; the muriatic acid fumes excited severe coughing at first; I found, that they had been disengaged at the patient's bed side; I now ordered them to

be disengaged so as to be disseminated throughout the appartment, but not immediately to reach the patient in great quantity; the cold shiverings were much less frequent than for some time past. I was informed, that the former medical attendants had for some weeks given a certain medicine, and was asked whether it should be continued; on examining it I was certain that it contained tinct. digitalis; I gave it as ordered by the label, and perceived the pulse immediately strengthened and accelerated by it; to be taken again in the evening; only one pill to be taken, cætera as yesterday. 25th, 26th, 27th. He continued as on the 24th, except that the cold shiverings were much less frequent, the sputa better coloured; pulse about 60: I gave him the mixture and it rose immediately to 65.

28. He does not think himself so well, had much cold shivering and sweating during the night; his urine contains much white sediment; sputa increased in quantity but white, except some streaks of a florid red colour; pulse about 50. I called again in the evening, he had been much worse; his pulse was 48. I gave another

dose of the mixture, which immediately strengthened and accelerated his pulse by about five beats a minute.

29. He had not been so sick nor brought up so much sputa which still were variegated with the red streaks; pulse still 48. Thinking that the diminution of the pulse might be influenced by the sickness and collection of pus, I gave him another dose which as formerly immediately strengthened and accelerated the pulse.

30. Sickness not so troublesome, sputa not nearly so copious, red streaks gone. He feels himself very weak, his urine does not contain so much sediment; stools pretty natural; he sweat much last night; pulse 48; mixture to be discontinued.

31. He had not much sickness since yesterday; his sputa now mixed with something green, were diminished much in quantity; he had a pretty easy night; his cough gave him more pain; pulse about 60. I called again in the evening, at which time he was very sick and had been so a great part of the afternoon; his sputa were very copious of mixed colours; pulse about 110, feeble and intermittent. I gave him two glasses of port-wine, and ordered the

same to be repeated at any time when he was seized with sickness.

February 1. Sickness had not troubled him much during the night, he had slept pretty well, his sputa were copious and better coloured, his urine contained much white sediment, he had not sweated much, he thought himself rather better, his face was somewhat flushed, his tongue was foul and moist; his pulse about 100.

2. He is continuing better without any cold shivering, sputa less in quantity and resembling laudable pus, his pulse is 100, strong and regular, he has some appetite for food, he took some tea with bread and butter this morning.

As the matter indicated a healthy state of the sores, and the circulation had assumed an inflammatory action, I ordered only half a glass of wine to be taken every two hours, but if cold shivering should come on to give two or even three glassfuls; his bowels were kept regular by one pill each night.

3 & 4. The same as the second.

5. In the afternoon of the 4th he had a sense of heat in the chest, followed at night by cold shivering, but not so severe as on

former occasions, followed also by an increase of the sputa which were white; he took at this time two glassfuls of wine which relieved him much, he slept pretty well, his pulse 120, irregular and not strong. Regimen to be continued.

6. He is much better, his sputa are diminished in quantity and of good colour, appetite better, pulse 100, regular and strong.

As it now appeared, that there was a disposition in the lungs to form new sores, and as the action of the system was such as favoured their proceeding through inflammation to suppuration, I now limited the wine to two glassfuls per diem, and kept the bowels regular by the suppertart. potassæ.

7, 8, 9, 10, 11. He had continued improving in appearance; his emaciation was diminishing, and he had got some appetite for food; pulse 90, pretty strong; sputa in small quantity; he had a sense of stiffness and tickling in the lungs. He sat up in bed to day the 11th, to let me feel his pulse.

12. He felt himself a little hot, thirsty and uneasy, he felt a darting pain in the

chest and had very little appetite this morning; sputa in very small quantity.

℞ accidi sulph. dilut. ℥ii.
Syrup. ros. rub. aq. ā ℥i. m.

two tea spoonfuls to be taken in a wine glass full of cold water every four hours while the sense of heat and restlessness continue, wine to be omitted to-day unless cold shivering come on.

It may with great propriety, I think, be doubted, whether the sulphuric or any other acid diluted, or taken in any admissible form, has the power of diminishing febrile heat.

13. He had a pretty severe attack of cold shivering last night; sputa much increased in quantity, but white; pulse 120, and other febrile symptoms are present.

To take Supertart. Potassæ, ℥i. this afternoon.

14, 15, 16, 17. He continued to get better every day, the sputa daily diminished in quantity, he slept well, his urine was without sediment, he now took, though in small quantity, of his usual food, and sat up an hour in the afternoon.

19. No puriform sputa, what was spit up resembled frothing saliva and was in

no great quantity; breathing pretty easy; slight cough; bowels natural, urine natural; he enjoyed quiet nights, and pretty good appetite; he sat out of bed several hours of the day without inconvenience; pulse 70, and regular; he had eaten a little steak with relish.

It did not seem any longer nccessary to continue the inhalation of the muriatic acid, as there was reason to believe, that the sores of the lungs had closed; and it occurred to me, that the same stimulus which would promote the healthy action of a diseased surface, could injure a sound one, and much more readily one in a recent state of cicatrization. I have no doubt that muriatic acid gas diluted as in this case, inhaled into sound lungs, would soon produce inflammation of the bronchia.

Accordingly I ordered the fumigation to be discontinued.

The patient continued thus gradually improving for eight days more, when his cough became sharp and painful, and his breathing somewhat stiff; he felt some heat in the middle of the chest, and his sleep was not so sound; he was now able to walk in his room; his appetite was a little

impaired, and he felt a slight heat over the body; his urine was high coloured, and bowels rather costive.

I ordered him to desist from taking animal food.

℞ Pulv. jalap. comp. ʒiss.

to be taken in warm gruel immediately.

His appetite returned; in three days the puriform sputa, which had recurred in small quantity, had quite disappeared again; the fumigation was again desisted from; the patient could walk pretty easily for some considerable time in his room, and had the highest hopes of recovery. He continued improving in health to the 19th March, when I left town, and requested another medical gentleman to visit him in my absence. During this time he was seized with a sort of asthmatic affection, which yielded to the pill. scilliticæ and the inhalation of the steam of water.

On my return in May I found him wonderfully improved in health and stout; we now sent him to the country.

The inhalation of gently stimulating substances in the manner just described, is of

very great utility in chronic affections of the lungs, and those accompanying general debility from whatever cause. In the Journal de Médecine there is an essay in which the propriety of administering stimulant inhalation to operate on the lungs immediately and locally, is strenuously and judiciously maintained, and the author affirms, that he often succeeded by this remedy in curing very dangerous chronic affections of the breast.*

May not a great, if not the greater part of the beneficial effects, which have been derived from the fumigating with acids where contagious fevers were raging, be ascribed to the immediate agency of the vapours on the exterior surface of the body, and of those inhaled on the interior surfaces of the lungs?

* Reflexions et Observations, sur la Médecine Pneumatique, et sur les Principaux Moyens de Traiter les Affections Chroniques de la Poitrine, par J. B. Burdin. tome x. p. 144.

SECTION VI.

Utility of administering Digitalis in the Suppurative Stage.

IN this stage it is, that digitalis is unequivocally and certainly useful; some however, have supposed, that there are at least two species of consumption, in one of which the use of digitalis is attended with advantage, in the other not; though this is correct, according to the distinction suggested in the sixth chapter, it appears to me, that they would have discovered a more satisfactory solution for by far the greatest number of their difficulties, if they had supposed, that there were two stages, in one of which it was highly salutary, in the other dangerous, if not decidedly pernicious: In this manner, I can account for the disappointments of which Ferriar so often, and I believe very justly, complains.

To establish the truth of this assertion, I not only appeal to the experiments and cases which I have detailed in the second

part of this work, but to every case on record: and in what manner the administration of it ought to be conducted, cannot perhaps be more clearly pointed out than by the following anecdote. Last winter a gentleman of my acquaintance informed me, that there was a patient in the Royal Infirmary affected with phthisis pulmonalis in the suppurative stage, to whom digitalis was prescribed, and asked me what I expected would be the consequence of its administration in this case. I answered, that digitalis was one of the best remedies that could be employed, but that, if care were not taken to intermit its use when inflammatory symptoms began to increase, that the consequences would be very bad. This gentleman watched daily the progress of the case; the febrile symptoms in a few days were aggravated, the pulse became strong, the patient restless, hot and uneasy; she became sensible, that every dose of the medicine made her worse, and refused to receive any more of it, when Dr Duncan, senior, with his usual prudence and good sense, discontinued the prescription.

SECTION VII.

New Modes of Treatment proposed for the removal of Air or of Puriform Matter from the Cavities of the Chest.

THERE are, not unfrequently, two consequences of phthisis which require distinct consideration, viz. either the effusion of puriform matter, or that of air into the cavity of the pleura investing the thorax.

I am persuaded, that the operation of paracentesis thoracis, which has been very rarely performed for the evacuation of puriform matter from that cavity, would very often be of great service. The objections to this operation seem to be derived from an opinion of the delicacy of the lungs and the danger of either irritation or collapse of them, when air is admitted into the cavity of the pleura.

We have already seen some astonishing morbid changes to which the lungs are liable; and it may be affirmed, that no viscus, the spleen perhaps excepted, can suffer to a greater extent than they.

Extraneous bodies, such as bullets, have long remained in the lungs almost without exciting uneasiness or pain; and wounded with sharp instruments, they have healed by the first intention.

Those of one side have even been almost entirely converted into pus and sloughs; or even, with part of the bronchos, have seemed to be one gelatinous mass; sometimes the denuded vessels appear to have been cut across as it were, showing their mouths open, or obstructed with a species of callus; in fine, so complete has the destruction been, that those of one side were declared to be totally wanting. What other internal or external part ever exhibited a worse state while life remained?

By a series of experiments made during the last four years, on the effects of air admitted into the cavities of the pleura through apertures made in each side of the thorax of dogs, it has been ascertained, that incised wounds of the lungs, not affecting any of the larger blood vessels, heal by the first intention.

It has been long well known, that a portion of the lungs may be cut out without

producing death;* I have further ascertained, that when a large portion of them is cut off, the air, in the mean time, having free access, and the puriform matter free outlet, the wound heals, like any common external sore, and the lungs afterward perform their function without any perceptible impediment; that air admitted into the cavities of the thorax, even for any length of time, does not induce inflammation of the pleura pulmonalis; and that, contrary to the opinions of Vesalius, Mayow, Houston, Van Swieten, Haller, Whytt, Monro and others, the lungs do not instantly collapse, even though air is admitted through two apertures in opposite sides of the thorax, each at least thrice the diameter of the rima glotidis.

Mayow ascertained† that the common air inspired, diminished in volume. Dr Hales‡ endeavours to explain this fact by supposing, that the vapours arising from animal bodies partly destroy the elasticity of the air, and in this way accounts for the diminution of any redundant quan-

* Halleri Physiolog. Prim. Lin. de Pancreate.

† Exper. de Sp. Nitro Aëreo.

‡ Statical Essays, Analysis of Air, vol. i.

tity which may have escaped through the wounded or imperfect lungs into the cavity of the thorax.

It would be tedious to inquire here whether this explanation is well founded; I feel myself happy however, in being able to state two facts which seem to be of infinite practical importance: first, That air, not passing from the interior of the lungs, as in the occurrences alleged by Hales, but admitted through orifices made in the parietes of the thorax where the lungs are sound, rapidly disappears from the cavities of the pleura; second, That the gravity of the lungs may be used so as completely to obviate the pressure of air entering through such wounds or orifices.

In consequence of the former fact being communicated to Mr James Wardrope, a surgeon of this city, he successfully treated an effusion of air through the wounded lungs, by merely putting a linen roller round the thorax to keep the fractured ribs steady, and trusting to the power of absorption for the removal of the air.* But when

* *Vide* Disput. Med. Inaug. De Pneumatosi Andreæ Halliday, M. D. viii. Cal. Jul. edit. 1806, appendicem.

the air is effused in greater quantity than the absorbents can remove, all that is necessary, conformably to the latter fact, is to order the patient to lie prone, in which position of body the gravity of the lungs will entirely prevent the accumulation of air in the cavity of the pleura. How useful it is to be aware of this, will appear from the relation of the following unfortunate occurrence, of which I was informed immediately after it happened, and was present at the examination of the body.

An apparently stout young man, who had some time laboured under pulmonary complaints, was suddenly seized with a sense of suffocation and other symptoms of effused air oppressing the lungs. After consultation it was agreed to perforate the thorax; but instead of air escaping, the atmospherical air rushed in, and the man died of the operation. If this man had been ordered to lie prone, no operation would have been necessary, and he might have been still alive.

When therefore it is judged proper to perforate the thorax to allow puriform matter to escape from the cavity, the patient should lie in that position in which there

is no danger of collapse of the lungs from the pressure of the atmosphere, and the fluid matters will escape by their own gravity, assisted by the distending lungs.

In conducting these experiments, I had the assistance of my learned friend Dr John Barclay, Lecturer on Anatomy in this city, which is sufficient proof, that I wished them to be made with as much anatomical accuracy as possible.

If these facts satisfy us, that the thorax may be perforated without much danger from the operation; that the lungs can bear the ravages of disease, and will heal as well as any part of the body, when the purulent and acrid matters are evacuated—we cannot hesitate to affirm, that such matters should be discharged from the cavity of the thorax as speedily as possible, where such an organ as the lungs, and such a function as respiration, are concerned.

"From having opened," says Dr William Hunter,* "a great variety of dead bodies, I cannot help thinking that many lives might be saved, if it was the custom to try the operation for the *empyema*, in

* Med. Obs. et Inq.

most cases, where there is supposed to be suppuration in the chest, especially where there is reason to believe that the disease is merely local; as after pleurisies, in people that are not strumous, or otherwise unsound in their whole habit: and more especially still, wherever we can, from the symptoms, ascertain the seat of the abscess with some degree of probability. In such cases, if ever we are fortunate enough to discharge the matter, we give the patient a very good chance for life, who had almost none without such an attempt; and, if we fail, we shall have done no great mischief."

If the operation were performed, should not such substances be injected as are found useful in promoting the healthy action of sores? There is a case related in Bonetus,* in which a prodigious quantity of puriform matter was evacuated by paracentesis thoracis, and decoctions of myrrh and aloes were injected to promote the healing of the wounds with the very best effects.

I am of opinion, that physicians have too frequently abandoned their patients under such circumstances, nor can I better ex-

* Sect. vi. obs. iv. p. 674.

press my disapprobation of such conduct than in the words of Lord Bacon:

"Therefore I will not doubt to note as a deficience, that they inquire not the perfect cures of many diseases, or extremities of diseases, but, pronouncing them incurable, *do enact a law of neglect*, and exempt ignorance from discredit."

CHAPTER IX.

TREATMENT OF THE THIRD STAGE.

IN the third stage, or when the symptoms of gangrene and sphacelation are present, the strength of the patient must be supported by all possible means; here the person often faints on attempting to rise, or even on being raised, therefore bodily motion is to be prohibited.

Though life never remains long after the influence of mortification has tainted the general powers of vitality, yet it has been long protracted, when, as has just been proved, the lungs have been wasted to an astonishing degree, and it is impossible to say, when to afford relief cannot, or ought not to be attempted. We ought not to abandon the patient, even when the dismal image of death is pourtrayed in the countenance, and the longing, lingering looks of the departing victim, show all the anxious misery of calm despair.

Means and substances of the most dissimilar nature, the most active and the most inert, the mithridate and lichen Icelandicus, have all been successful and have all failed in removing this disease.

Which discordant accounts may, perhaps, be reconciled with the truth, when we know that, on some occasions, the affection is so gentle, that it would be obviated without the interference of art; that, on other occasions, it is beyond the reach of human ingenuity; that it undergoes changes in the same individual, requiring corresponding changes of treatment; that, in fine, it is the most precarious, insidious and delusive of all the destroyers of mankind.

Human milk, and that of the ass, mare, cow, goat, ewe, have all been prescribed, and that, too, in this last stage, when nothing but the most stimulant and nutritious substances can support the nearly exhausted vital powers! Human and ass milk are preferred, because they are most serous, that is, merely *because they are weakest!* Who would prescribe ass milk to a person reduced to extreme debility from a gangrenous limb? what is there in such milk?

what in serum, to remove depraved pus, to obviate putrefaction, to promote healthy granulation, to restore and sustain the proper action of the vascular systems, of all the vital and all the animal functions? O reason, first of human faculties, whither hast thou fled!

I am inclined to believe, that it was the treatment of phthisis pulmonalis, which suggested to Bacon this observation, "that, though from daily practice it might be expected, that physicians had formed correct rules of treatment, nothing was discovered on examining their prescriptions but temporary expedients and perplexity of judgment." *

* Lib. i. De Augmentis Scient.

PART II.

AN

INQUIRY

CONCERNING

DIGITALIS,

&c.

INQUIRY, &c.

CHAPTER I.

EXPERIMENTAL PART OF THE INQUIRY.

SECTION I.

Preliminary Observations.

BEFORE I commenced the study of the administration and operation of the articles of the materia medica, as a particular branch of my medical education, curiosity had made me pay some attention to the immediate effects that the tincture of the purple digitalis produced, when received into the human body. I observed, that it uniformly strengthened the arterial pulsations, and made them succeed one another more rapidly. So little was I acquainted with the views of medical men, that I believed it to be their intention to produce these effects

by the medicine: afterward I was not a little surprised to learn, that this substance was deemed by authors, teachers, and practitioners of medicine, to be a direct sedative, endowed with the most remarkable property of diminishing the momentum of the blood and the number of pulsations in a given time.

The authority of those who maintained the above opinion induced me to conclude, that my observation had been incorrect, and I resolved to lose no occasion of discovering the reason of this mistake. Instances but too soon occurred of this substance being prescribed to persons in whose fate I felt the most lively concern. I administered carefully the prescribed dose, and always found the reverse of immediate diminution either in the force or the frequency of the pulse. I watched the immediate effects of it on the patients to whom it was prescribed in the Royal Infirmary of this city, and had the pleasure to witness some very remarkable cures accomplished by means of it, in phthisical and dropsical persons under the care of Dr Duncan, senior, and Dr Home, junior, but its immediate effects invariably

corresponded with those which I had first observed.

Two years ago, Dr Gloster, one of the Presidents of the Royal Physical Society, watched its administration in this hospital, and the results of his experience confirmed my observations in every particular; and last year, Mr De Courci Laffan, student of medicine, not only attended to its effects in the patients to whom it was prescribed in the hospital, but also in private cases, and in no instance did he find the results different from those which I have stated.

SECTION II.

Concerning the Effects of Digitalis on the Pulse of Healthy Persons.

AT length I began to believe, that those who had written on the subject of digitalis might have been led into mistake, and proposed to some gentlemen of my acquaintance, that we should institute experiments to ascertain the medicinal qualities of this substance. We agreed to take it ourselves in order to ascertain its effects during health, and some of us devoted much time and attention to observe how it operated in those labouring under disease.*

Many gentlemen have occasionally taken it with me, whose names I have forgotten, but I acknowledge myself much indebted to the following, whose names are arranged in the order of time in which they made their experiments. Mr Richard Arrindel, student of medicine; Dr Benjamin Hardt-

* The tincture of digitalis, which I employed in all those experiments, was accurately prepared according to the Edinburgh Pharmacopœia by Mr Benjamin Brown, surgeon and apothecary.

man; Mr Theodore Gilbert, surgeon; Drs Charles Farquharson, C. D. Johnston, Henry Davies, J. H. Walker, William Winstanley, lecturer on botany in Manchester; Dr David M'Laggan, one of the presidents of the Royal Physical Society; Mr Murray, lecturer on chemistry; Mr G. R. Nuttle, student of medicine; Mr George Gordon, one of the presidents of the Royal Medical Society of Edinburgh; Mr R. H. Dyett, surgeon; Mr J. W. Turner, student of medicine; Mr Hall Veitch, surgeon; Dr James Low, president of the Royal Physical Society; Dr William Stott; Mr J. T. Caines, and Mr William Back, students of medicine; Dr John Gordon, one of the presidents of the Royal Medical Society; Mr Alexander Walker, lecturer on the laws of organic existence; Drs Hinton Spalding, and H. H. Tyler; Mr De Courci Laffan, student of medicine; Dr Thomas Lee; Mr Allan Burns, lecturer on anatomy and surgery in Glasgow; Mr Henry Hardie, Mr Michael M'Creery, and Mr George Sanders, students of medicine.

Two or more of us met at a time, counted each others pulses, administered to each other from 10 to 30 gtt. of the tincture of

digitalis in a wine glassful of cold water, and the general result was, that these small doses increased the force and frequency of the pulse. We previously satisfied ourselves, that the swallowing of the same quantity of water, produced no sensible effect on the circulation, nor was the effect different when we put into the water a quantity of alcohol equal to the dose of the tincture of digitalis; thus it was evident, that the effects were to be ascribed peculiarly to the digitalis contained in the draught.

The human mind is wonderfully fertile in objections to facts, which are repugnant to opinions sanctioned by general consent; and this faculty of the mind has contributed much to the advancement of accurate science, though it has also retarded her progress when exerted in defence of prejudice, or from motives ungenerous and culpable. Those gentlemen, who objected to the experiments which I had made, were actuated by the purest motives, and as I wished to ascertain and establish the truth, I entreated them to repeat the experiments along with me; and no one has done so, who has not assured me, that he

was convinced of the stimulant powers of this remedy, and it was in this way that all those whose names are mentioned, were induced to repeat the experiments.

One gentleman in particular was of opinion, that the mind, in expectation, might have some influence in increasing the strength and frequency of the pulse. I replied, that as he expected, that the pulse would be diminished both in number and strength, I advised him to take a dose of it, to satisfy himself whether the event would correspond with his expectation; accordingly he, other three gentlemen and myself met, and the event in all was an increase of the pulse in frequency and force.

That the mind indeed had very little influence in modifying the effects of the digitalis, is established by this fact: water, coloured with inert substances, given to persons who think they are receiving digitalis, is followed by no change in the state of the pulsations, after which if the digitalis be taken, the arterial system never fails to evince the phenomena which I am now detailing.

I taught some persons, who had no interest in medical theories, to count the pulse

of their relations, to whom this medicine was prescribed, and they all assured me, that they perceived the beats become stronger and quicker after taking the dose.

The dose of digitalis is no sooner swallowed, than changes are perceptible in the arterial contractions. Sometimes the pulse flutters for the first three or four seconds, and then becomes regular, firmer and more frequent than before the dose was taken; occasionally it will evince a degree of irregularity in the strength and succession of its beats even for an hour; there is often an increase of impetus and none of velocity, or the contrary; often also, the one precedes the other, though in general, they accompany each other. I have once or twice observed, after a large dose, that the pulse seemed to stop for a moment, and then proceeded with increased activity; in some persons I have observed the pulse diminish in number, and at the same time, become much stronger; this however never happened, but when the pulse was irregular both before and after the taking of the medicine, and when it was taken by the same person at another time, the pulse followed the general rule.

The stimulant effects of digitalis are not transitory, but of different duration according to peculiarity of constitution. Of these experiments I made and witnessed at least two thousand, with this uniform result,—augmentation of the velocity and impetus of the circulation in healthy persons.

I now resolved to observe what might be the effects of digitalis on the healthy system, if it were taken daily for some length of time.

To know what my pulse was in my usual state of health and manner of living, I kept a table of the number of pulsations counted daily for many weeks before breakfast, and before supper. In the morning before I took any exercise, my pulse was uniformly 60, feeble; and at night after sitting about two hours, it was 56, feeble.

This being ascertained, I began, 24th May 1805, to take fifteen drops of the tincture of digitalis in a wine glassful of cold water, night and morning. The first three days, my pulse was about 70 in the morning and 66 in the evening, during which time I felt myself uncommonly well, except, I thought

that I sometimes felt slight shifting pains in the breast.

My daily reports after the 27th, on which I took 25 gtt. are:

May 28. I passed a restless night, being hot and feverish, and the pain of breast, which I had been troubled with, was more severe than ever this morning, and from the ensiform cartilage upward, my breast was sore to the touch; pulse before breakfast 76, and strong, and in the evening about 70.

26. I was harassed with tormina the preceding night after going to bed, which did not abate before three o'clock in the morning. I had a sense of weight in the head and of uneasiness in the breast all day; pulse as yesterday.

30. I slept but little during the night, and my mind had somewhat of that restless activity which I have experienced after taking too much wine, but particularly after taking tinct. opii; pulse about 80 in the morning, and 90 in the evening: during this day I took 50 gtt. of the tinct. digitalis.

31. I was very drowsy when I went to bed, but did not sleep soundly. I had a

troublesome sense of weight in the head, which was relieved in the forenoon by an attack of epistaxis. I continued drowsy and incapable of study till the evening. Appetite still impaired; pulse nearly as that of last night. My taking of the digitalis was now given up.

June 1. My headach still continued; I slept better during the night; appetite still impaired and mind incapable of study; pulse nearly as yesterday. I took a laxative composed of aloes and hyosciamus, and adopted an antiphlogistic regimen.

June 2. I slept well during the night; appetite impaired; pill operated gently during the day; on the 3d some degree of headach and unsteadiness of mind were still present; my pulse about 78 and pretty full. In eight days from the first of June, the pulse returned to its usual standard.

These facts afford this inference, that digitalis possesses the property of increasing the frequency and force of the pulsations in healthy persons, and that, if its use is persevered in, it will induce the symptoms of inflammatory disease.

SECTION III.

Reasons for believing that the Digitalis is administered on False Principles.

THE effects of the digitalis on the healthy constitution precede in this detail those on the constitution disturbed by disease, but it is an inversion of the order in which the facts occurred to my observation; besides attending, as I have already said, to what happened in the patients in the Infirmary, I had carefully marked the particulars of the following cases, before the experiments were made on persons in health.

It seems not improper to mention here, that the first cases, which I watched, were those of persons under the care of the first medical men of this city; I prescribed no medicines, nor did I interfere in the management; I only, for my own instruction, noted the symptoms, attended when the medicines were taken, and carefully marked whatever changes supervened in the pulse, as well as in the general state of the constitution of the patient.

CASE I.

Mrs ———, aged 46, of ordinary stature, florid complexion, dark eyes and hair, haughty and irascible mind; was sometimes extraordinarily animated and lively, but more frequently peevish, melancholy and dispirited. In September 1802 she took a very distressing catarrh, which yielded, in a short time, to the antiphlogistic treatment, but there remained slight pains of the chest, with a tickling sensation in the fauces, and a short dry cough, aggravated on taking exercise. These symptoms became imperceptibly worse; in the beginning of December she could only lie on the left side; her pulse, which had risen gradually in the course of three months from between 60 and 70, was now about 90, and feeble. Her nights were restless, her days gloomy; and desire of death, which she had often expressed after the loss of her husband, who had died some years before of phthisis pulmonalis, was now more frequently repeated and with greater earnestness than ever. Since that misfortune, opium had been her only solace; she

began by taking small doses of the tincture, and had imperceptibly augmented them till the quantity that she took daily, for some months, was enormous, frequently five tea-spoonfuls in twenty-four hours, and the spoon contained easily 100 gtt. She was very languid in the mornings, had no appetite, tea made her sick, and she vomited whatever she took to breakfast. Her stools were pretty natural, urine high coloured. She was ordered, in the beginning of January 1803, to limit the quantity of tinct. opii to 30 gtt. twice a-day, and to take 10 gtt. tinct. digitalis three times a-day, and to increase the dose to 20 gtt. gradually. I examined the pulse before and after every dose, and found it increased in strength and in number of beats. It was raised to about 100, and continued so for an hour or two after every dose. She became cheerful, thought herself improving in health for five weeks, during which time she had obeyed the prescription with a few intermissions of a day or two, and, at the end of it, she thought herself so much better, that medicine was unnecessary; but she was persuaded not to desist from its use, by being told, as is too often done, *that she ought not*

to give up the use of a substance which had done her such evident service. The pulse had been gradually rising, and was now about 120. She began to be affected with cold shiverings, and in five weeks more she laboured under a most violent hectic fever; the pulse in the hot stage about 150, and strong; in the cold, so irregular and feeble that it could not be counted; the purulent sputa were very copious. The digitalis had, all this time, been taken, but not daily, for she sometimes imagined that it was hurtful to her, and let it alone for two or three days; again, imagining it salutary, she resumed its use. After every dose taken in my presence the pulse became more regular and firm, and, during the last five weeks, had arrived at the alarming number already stated. The event of this complaint I need scarcely mention.

CASE II.

Mrs ———, widow, and mother of nine children, aged 39 years, was admitted into the Lying-in Hospital of this city toward the end of May 1803. Her shape

was such as is deemed characteristic of predisposition to phthisis, and, from her appearance, it could not be doubted, that such an affection had already made considerable ravages on her constitution. It occurred to me, that I should embrace this opportunity of observing the effects of pregnancy and parturition in such a state of body. Her ankles swelled toward evening, but this is a very common occurrence in the last stage of pregnancy, and several of her other complaints might have been attributed to the same source, were it not that she had been affected for more than three years with a dry cough, difficulty of respiration resembling asthma on taking exercise, slight obtuse pain of the left side, &c.

Her pulse was now pretty quick and irregular; but the pulse exhibits very great varieties in all pregnant women, and is, during pregnancy, more quick and variable than during health, at other times, in the same person.

On 3d April, after an easy and short labour, she was delivered of a male child by one of Dr Hamilton's pupils. Immediately after delivery she was remarkably feeble and exhausted, but speedily regained her

strength, and, in a fortnight, took leave of the house. I was surprised to find, that all this time, her pulse never gave fewer than 120 beats per minute, and the swelling of the lower extremities continued.

Not long after her dismissal she entreated my assistance. I found her in a truly pitiable condition. Her breasts enormously swelled, hard and knotty; pulse 120, and strong; tongue foul; face flushed; breathing uncommonly difficult; abdomen and inferior extremities dropsical; an odd combination of the symptoms of inflammatory fever and extreme debility. By the free use of saline purgatives, the distension and tumors of the mammæ were subdued; respiration was very much relieved by a large vesication, which was always re-produced, for when it was allowed to heal, she felt as if threatened with instant suffocation. The pulse became again 120, and feeble; the symptoms of phthisis pulmonalis, hydrothorax, anasarca, ascites, made alarming progress.

In this case I thought it proper to try what digitalis could effect, along with as good diet as she could procure. The bowels were kept regular. Half a grain of foll. digitalis

was administered night and morning, and half an ounce of the pulv. cinchonæ was taken during the day. Her pulse continued three weeks undiminished in number, of increased strength and regular. In the mean time, the quantity of urine discharged became greater, the swellings decreased, the pectoral symptoms were much relieved, so that the patient conceived fond hopes of recovery; strange tenacity of life, gratified with the prospect of existence amidst disgrace and poverty! - -

At the end of this time, the pulse became feeble, intermittent, slow, of not more than fifty-five or sixty beats per minute; thirty drops of tinct. opii were now given twice a-day instead of the digitalis; the regimen, in other respects, remaining the same; in three days the pulse became very good, of seventy beats per minute, but the other symptoms worse. The digitalis was now repeated in greater doses with a repetition of the same phenomena, except that the pulse was elevated to a much greater degree, and, in a much shorter time, the intermission and paucity of its beats recurred; it was again restored by the

laudanum. This was repeated with the same result several times.

To ascertain how far other stimulants would promote the restoration of vigor in the sanguiferous system, wine, gin-punch, porter, &c. were used in very considerable quantity; but, what astonished me, without altering the pulse in the least; the laudanum being added, recruited the pulse in about three days.

The treatment of this case partly resembles that of a man named Cunningham, who was under the care of Dr Duncan, senior, in the Royal Infirmary.*

Finding, that the beneficial influence of the digitalis was but of short duration, and by no means adequate to compensate the bad effects which ensued, I endeavoured to give relief by other remedies. Squills and calomel were used in very great doses internally, and a drachm of the mercurial ointment was rubbed on the limbs daily. An immense quantity of mercury thus introduced into the system never excited salivation, nor did she complain of uneasiness in her teeth or gums; and such was the

* Annals of Medicine.

inveteracy of the disease, that these powerful substances never so much as alleviated the symptoms; but the digitalis was never taken without exhibiting, in a greater or less degree, the effects already enumerated.

This complication of maladies at last reached the highest pitch of malignity. The head and trunk, with extremities superior and inferior, were one mass of tumefaction. Excruciating pains were felt in the feet, on which rose large blisters, resembling those from boiling water; the toes became black; mortification seized various parts of her body, and was spreading with rapid havoc, when one night in September terminated her sufferings.

The case of this patient was to me very instructive. The events were in perfect conformity with what is affirmed by Dr Hamilton in his invaluable Lectures on Midwifery; "that if the pulse remain several days after delivery to beat above 100 per minute, we may be assured, that there is some latent evil preying on the constitution, which will soon manifest itself in the form of some dreadful distemper,"—a remark highly honourable to his genius and

talent for observation; and, "that death is the inevitable consequence of parturition to a woman labouring under an advanced phthisis pulmonalis."

CASE III.

Mr ———, aged 15. This patient had scrofulous swellings of the bones, muscles and glands; besides symptoms of pulmonary consumption. He was of great, or rather premature, judgment. His complaints began to show themselves after a severe cold which he caught in the north of Scotland. He had soft tumors on the angles of the inferior maxilla, on the right side of the dorsal and lumbar vertebræ, on the middle and at the joints of the superior and inferior extremities; the tops of those on the joints were brown, with open sores discharging a thin, transparent, viscid matter, sometimes fetid and containing spiculæ of carious bone; these tumors and sores were particularly conspicuous on the second joints of his thumbs; he had in general an uncommonly keen appetite, was peculiarly fond of highly seasoned food and ar-

dent spirits; his sputa resembled much the matter discharged from the exterior of his body; his urine sometimes deposited a red, at others a white sediment; his bowels were rather costive; pulse 110, sometimes even 120.

He took, according to prescription, half a grain of foll. digitalis with one grain of the submuriat of mercury, night and morning, for six weeks, during which time, the pectoral complaints were removed, and the sores discharged a much smaller quantity; the pulse was rendered full and regular, but never evinced any peculiar alteration either in the diminution or increase of the number of its beats. The use of the digitalis was now discontinued, a day or two after which he was seized with sickness and vomiting. I am not certain whether this occurrence should be attributed to the digitalis, for there was no remarkable diminution in the number of pulsations, and he had often been similarly affected previously to its use, but not during it.

After this, I gave him the muriat of lime to the amount of half a drachm a-day in solution, which seemed to be of very great service to him, not only in diminishing

some of the tumors, but more conspicuously in invigorating his body; for at the end of a month, he was able to walk out and amuse himself; his progress however, in convalescence, did not long continue, although he persevered in the use of the same preparation.

There was no distinct return of his pulmonary complaint for some time, but that hectic fever of the continued kind, which is described by Galèn, and seems to have been well known in his time,* with general wasting, destroyed his body; the bones, muscles, tendons, cellular substance and membranes, all wasted. He did not yet suffer much from pain, and he saw his dissolution near with much complacency. At length however, he was much pained, he had a severe cough and expectorated copiously the most horrid stuff. Nothing afforded him alleviation and repose but opium. Some short time before his death the fifth, sixth, and seventh ribs were fractured at their salient curvatures by his weight on them in bed. His senses remained entire to his last moments, when

* De Different. Febrium, a cap. x. ad xiii.

he was a singular spectacle of decay; his head, like that of a fœtus, seemed the largest and most weighty part of his body.

In these three cases, increased impetus of arterial action continued for several weeks during the administration of digitalis. Comparing this fact with the other, that digitalis accelerates and strengthens the pulse in healthy persons, and, by its continued use, induces symptoms of inflammatory fever, I believed, that the powers of digitalis were misunderstood, and that it was administered on false principles by those who prescribed it for the purpose of immediately diminishing the vigour and frequency of the contractions of the heart and arteries.

SECTION IV.

Demonstrates, that the Digitalis is administered on False Principles, and that its Primary Operation is powerfully Stimulant.

IN February 1805, Mr Arrindell and myself agreed, that we would observe the effects of the digitalis more strictly than had yet been done in disease; that we would stay by the patients a much longer time at each visit, and, for the sake of accurate comparison, mark the state of the pulse for some days before the administration of the digitalis, and, afterward, mark the immediate effects of it when each dose was taken, and also make daily reports of the pulse counted some hours after one dose and before the taking of another.

CASE I.

March 2. 1805. Mr WILLIAM SHIRREFF, aged 18, was stout, plump and ruddy, with brilliant dark eyes and dark hair; of a most

acute mind and exalted genius. He was fond of bodily exercises, bold, active and enterprising. When he was keenly animated by any passion, his eyes expressed astonishing vivacity and energy of soul. But nature, as if to render her favours abortive, had sowed deeply in his constitution the seeds of disease. He had occasionally, for several years, felt pains of the thorax extending particularly toward the left shoulder, both with and without spitting of blood, which had always, before the 4th of February last, yielded to venæsection and a strict antiphlogistic regimen. On the evening before this last attack, when walking with an acquaintance, his foot slipped, he fell and threw his arms backward to save himself; on rising, he complained of pain in his breast, and, being uneasy, went home: next day, while earnestly occupied in painting,* a sudden sense of heat in the breast and sickness at stomach overwhelmed him,

* He was at this moment finishing an original design, which he had conceived the year before, representing the escape of Mary, Queen of Scots, from Lochleven Castle. This piece, considering the age of Mr Shirreff, is worthy of great admiration. It has since been engraved by Mr W. H. Lizars, his acquaintance, of the same age with himself, in a very masterly style.

and he instantly vomited an immense quantity of florid red blood.

The first medical assistance of this city was procured; he was freely bled at the arm the first afternoon and the succeeding day; on the third evening, I saw him for the first time after that misfortune; his looks were the most ghastly and pale imaginable; he vomited mouthfuls of blood every few minutes, and death was expected every moment.

Though I had no right to interfere in the treatment, yet, in this awful state of despair, I advised his father to apply flannel soaked in cold vinegar and water to the breast, which, after some hesitation, the vomiting of blood becoming still more urgent, he did, and from that instant the hæmoptysis stopped. Next morning, the medical attendants approved of what had been done, and ordered the application to be repeated, if necessary. He seemed, for some days, convalescent, but there remained a teazing cough and pain under the sternum; he did not sleep well, and was sometimes very feverish, but had no cold shiverings. About ten days ago, these however came on in a

slight degree, succeeded by pretty copious expectoration, and still continued.

This day, the tincture of digitalis was prescribed by the physician, and Mr Roberton and myself agreed to watch its effects. His pulse had, in general, been about 96 per minute and not strong, but at four o'clock P. M. the pulse was varying from 94 to 96, and immediately after taking 11 gtt. of the tinct. digitalis, it beat 100 per minute and was much stronger.

3. Ten o'clock A. M. He has passed an easier night; has taken some food this morning; pulse about 100, immediately raised to 106 by 11 gtt. of the tinct. digitalis. Four o'clock P. M. he had been somewhat restless in the former part of the day; his pulse was now about 100, and pretty full; instantly much increased by 11 gtt. of digitalis.

4. Reports of this day nearly as those of the preceding.

5. Ten o'clock A. M. pulse 104, pretty regular, by 11 gtt. instantly rendered more frequent, and, in a few minutes, much stronger. Both yesterday and to-day the digitalis seemed to excite coughing. The patient complained, that the difficulty of

respiration had been much more distressing to-day. Sputa less in quantity and less fluid than I had observed them to be on any former day.

He complained also, that the force and frequency of his pulse beating in his head and neck disturbed and alarmed him during the night. He has been very restless in the night and is so still. Took an opiate draught last night which he has done every night since he was last seized; it uniformly quieted and gave him relief. This young gentleman having paid some attention to anatomy, observed his pulse with peculiar care, and was much alarmed at any change which he thought that he perceived in it; he sent for Mr Roberton a few nights ago, because he dreaded, that his pulse would immediately cease to beat. Four o'clock, P. M. he has been very feverish, thirsty, restless and drowsy all day; pulse 105, and strong; 11 gtt. instantly raised it to 112, and in about three minutes it was much stronger. Half an hour past eleven P. M. all the symptoms were much aggravated, and the pulse beat 120. A short time before I arrived, the patient finding himself very uneasy had taken an opiate with some relief.

6. Ten o'clock A. M. his face is flushed and anxious; breathing more difficult than ever, he feels severe pain in the right side, and evinces some degree of deafness. He had been alarmingly distressed to three o'clock in the morning, after which he slept some, and continued easier; pulse 128, as counted by Mr Roberton and myself. He had inhaled the steam of vinegar and water in the night with relief. The state of the pulse and other symptoms had become so much worse since the employment of the digitalis, that we doubted whether it should be continued; but, as the state of the patient was desperate, and as the digitalis had been found, according to authors, beneficial in such cases, it was resolved to increase the dose to 15 gtt. twice a-day, and in the mean time to watch the symptoms with the utmost care, and, if they were still aggravated, to intermit its use. On returning to the patient's bed-room, we found the pulse much milder, and beating 120.

This occurrence suggested to me, what I deem an important lesson in conducting such observations. If we had given the digitalis during the hot exacerbation which the patient suffered when we first examined,

the remission might in the same manner have ensued, and we would have been perhaps inclined to attribute to the medicine, what would have happened independently of it. 15 gtt. of the digitalis were now given him, which had no other immediate effect on the pulse, than that of making it stronger. When the medicine was offered him, he said he wished to have no more of it, for it made his pulse very strong. Half an hour past four o'clock P. M. he was very restless and dreaded instant suffocation from a species of asthmatic paroxysm. His pulse was exceedingly irregular, and his countenance livid. I gave him about ʒi. of sulphuric ether in a wine glassful of cold water, which instantly produced a discharge of flatus upwards, and was succeeded by relief and composure. The pulse was now 120, and continued so for 15 minutes, when I gave him other 15 gtt. of the digitalis, immediately after taking which, the pulse became variable, and in three minutes was 126, regular and stronger.

7. I visited him this morning along with Mr Roberton. He suffered many severe paroxysms of dyspnœa during the night; he enjoyed some rest before five in the

morning; had a severe febrile exacerbation between seven and eight o'clock, since which he has been somewhat calm; pulse about 116, and skin cool; 15 gtt. of digitalis immediately made it much stronger, and increased the beats to one hundred and twenty-three; he became immediately very restless, and complained much of his difficulty of breathing. Half an hour past four o'clock P. M. a vesicatory was now on his breast on account of the dyspnœa; he was very drowsy and restless; pulse 114, somewhat irregular, and not very strong; 15 gtt. made it immediately very irregular, but in three minutes it was distinctly about 120; slight cough was excited, but he coughed a little just before he took the draught. The sputa were much diminished in quantity and resembled small inspissated globules.

8. Ten o'clock A. M. the dose of the digitalis had been given fifteen minutes before I arrived; the pulse previously beat one hundred and twelve, immediately after taking the dose, it increased in velocity, and now it was one hundred and twenty-six, and very strong; the patient was very restless. Four o'clock P. M. the patient was exceedingly uneasy, every symptom re-

markably aggravated. He had been alarmingly ill from the time of our morning visit, and wildly delirious; pulse varying from 150 to 158. He often asked, why his breast was tearing open, and why portions were cutting from his lungs? This young gentleman's father, a man of literature and observation, would not allow any more of the digitalis to be given. The vesication had afforded no relief.

9. He had rested a little during the night after the opiate draught; the symptoms were in general mitigated; pulse 120; sputa as yesterday. Four o'clock P. M. he had been much easier than on the three preceding days; the breathless exacerbations were neither so frequent nor so severe; sputa as last described; pulse about 130; delirium somewhat abated.

10. Four o'clock P. M. the report of this day the same as that of the 9th, except that the sputa were fluid and more copious.

11. Ten o'clock A. M. he has been very restless all night; sputa as yesterday in quantity but much more fluid; he is now labouring under a hot exacerbation, with the pulse about 140, and strong.

12. Ten o'clock A. M. he had passed a very bad night; he took an opiate at midnight, which only increased the delirium; he was now torpid; eyes very heavy; nostrils expanded; mouth open; breathing laborious; features collapsed; countenance livid; pulse 138, not very weak; a slight degree of subsultus tendinum; he still takes food, and has had pretty good appetite all the time; he never has had any tendency to diarrhœa; his bowels have been kept regular by laxatives; his tongue has in general been moist, and not very sordid.

Next morning after some moments of fury and convulsion, he bade this world adieu forever.

The administration of digitalis was, in this case, sanctioned by that unanimous consent of medical authors, and universal practice of physicians to which the whole of this part of my work has an allusion. But this unfortunate youth had so long laboured under the disease, and the havock made in the lungs was evidently so extensive, that no human power could have saved him.

CASE II.

March 3. 1805. Mr ———, aged 45, a handsome little man, had all his life enjoyed pretty good health, as he thought. Pains of the breast however, of various severity, seized him occasionally ever since his 17th year. He was very liable to catarrh in autumn and spring, and the two last years the cough has often been so severe as to excite vomiting. He has never been able to run or climb much on account of dyspnœa. During the last winter, emaciation had made very great progress in his body. The cough was terribly distressing, and terminated in a discharge of transparent viscid sputa. Cold air, or cold any how applied, produced intolerable chilliness. About the beginning of last autumn, he was frequently sick in the mornings, and often vomited particularly on taking tea; but of late whatever he eats or drinks induces sickness and vomiting. He loathes all food; he does not suffer from any acute pain, but keeps himself in bed from a consciousness of great debility. He is fretful, peevish, and apprehensive of danger. He is, at

times, hypochondriacal, and during the last six months has often been outrageous, and shown many signs of a tendency to mental derangement, which was formerly in him not an uncommon temporary consequence of intoxication. For about three years past, he has been pretty sober, and has refrained from the worst kinds of dissipation.* When in his usual health, his pulse beat about fifty times per minute.

March 6. Five o'clock P.M. pulse about 60 and weak, which was not altered by 15 gtt. of tinct. digitalis.

10. Four o'clock P. M. pulse 66, made immediately stronger by 15 gtt. of digitalis, which dose was given twice a-day since the 6th.

11. The cough had been more troublesome during the night; he is somewhat cheerful; he took 15 gtt. of his own accord this morning. Five o'clock P. M. pulse 65, pretty strong; increased immediately in strength and velocity by 15 gtt.; in five minutes after taking the dose, it beat regularly 71. In a short time considerable coughing came on.

* He had long been devoted to the detestable practice of self-pollution.

12. The cough has been more troublesome at intervals during the night, than for some nights past, he slept however pretty soundly and was refreshed by it; pain of chest almost gone; sputa and urine as usual; mind pretty cheerful, and sensations more agreeable than he thinks they have been for six months; appetite improved; he took 15 gtt. this morning. Five o'clock P. M. pulse about 63, of natural strength; functions natural; 15 gtt. instantly increased the strength of the pulse, which I continued to feel for five minutes; in fifteen minutes more it was not quite so strong. Slight cough came on.

13. He enjoyed good rest in the night; cough easier; expectoration easier; pain of chest not troublesome; he took about 20 gtt. this morning; appetite not so good as yesterday; mind depressed; he felt some sickness this forenoon, which can scarcely be attributed to the medicine, as the patient had been but very few days free from sickness and vomiting for some months till within these three weeks, and had never been one day without sickness for a long time till he took the digitalis; evacuations

natural; pulse about 56, and feeble; which 20 gtt. of digitalis immediately invigorated, and increased to 58.

25. He has been very feeble since the former report; 20 gtt. digitalis have been taken twice a-day; pulse for three or four days has been 48, and strong; to-day the pulse is 48, and strong, except that a very feeble beat frequently intervenes; 30 gtt. instantly raised the number of its beats to 54, weaker and more regular; he has been much distressed with coughing and vomiting, and was very restless during the night; he has, for some days, refused his proper nourishment. This lowness of the pulse did not alarm me, for three years ago, when making observations to ascertain, whether there was any difference between the pulsations of night and morning, I counted this gentleman's pulse for some weeks, as well as that of several other persons, and found it, when to all appearance he enjoyed good health, to beat 50 in the morning and 48 in the evening. Its beats were uncommonly strong, a feeble one often intervening; so that in him the arterial system seemed to have resumed the number of its healthy action.

26. He had no vomiting last night; he was very sick, and much troubled with tenesmus; he had a sound and refreshing sleep this forenoon; countenance very pale; lips livid; gums of a pale red; teeth very clean and white, which they were not when he was in health; eyes of a pearly hue, and, though brilliant, expressive of languor; he complains of great debility. Half past four o'clock P. M. pulse 48, not very strong, with some indistinct beats; after 11 gtt. digitalis the pulse immediately became very irregular both in strength and number of beats; this state of the pulse continued about half an hour, when the pulsations became regular and of equal and moderate strength, and two more per minute.

28. Half past four o'clock P. M. a cathartic, given on the 26th, produced sickness and vomiting instead of the intended effect, since which he has continued very poorly. Last night, ghastliness and despair were depicted in his countenance; pulse about 42, and irregular. He now got a dose of a mass composed of aloes and the extract of hyosciamus; to take a glass of port wine almost every hour.

29. Half past four o'clock P. M. the pills above mentioned operated well during the night; they have relieved him much, and he has since had a comfortable sleep, and is much better; pulse 44, and pretty strong; 30 gtt. now excited slight cough, made the pulse first irregular, next vigorous and quicker, but, in half an hour, it was the same as before, and he says, that there is a certain uneasy sensation at the pit of his stomach which the drops always relieve.

30. Half past four o'clock, P. M. he slept well during the night, and had considerable pain in his breast this morning, which is much easier. Sputa, for some days, have been much thicker than before. He took 20 gtt. about eleven o'clock, A. M. and thought himself very comfortable till a little after one o'clock, but has been rather worse since; he has taken almost no food; he attributes this change to a mixture of beer and bread, sweetened with sugar, which he took; his looks are improved; pulse 44, with beats of unequal strength; he now took a small bit of beef-steak, and about half a pint of London porter, to which about ʒi. of alcohol was added; he would not have wine. Immediately after

taking these, his pulse was of equal strength, but not altered in number. In half an hour, he became drowsy, and his pulse was now less strong and about 42; in another half hour, it was firm and strong again and still 42, and the drowsiness left him; 20 gtt. made the pulse immediately irregular, and excited coughing, but the beats were, in a short time, 44 and strong. To take one of the laxative pills.

31. Half past four o'clock, P. M. he, having neglected to take the pill, has had no stool. He thought himself tolerably well, and enjoyed some sleep the latter part of yesterday, but has been very uneasy since midnight, and frequently attacked with very oppressive sickness. He took 20 gtt. about nine o'clock this morning, which very much relieved him; but, soon after midday, sickness attacked him with vomiting; pulse 42, regular and rather feeble; some beef, and porter containing alcohol, made it immediately 48, and strong; in ten minutes, it returned to 42, but continued strong. To take two pills.

April 1. The pills produced several fetid and dark brown stools since eleven o'clock last night; he has been frequently sick;

he has taken some food. Half past four o'clock P. M. pulse about 44 and not strong; in a few minutes it seemed to increase in strength; he now took some porter and alcohol, which had no effect on the pulse; in half an hour more, the pulse continuing as above, he took two glasses of port wine, which had no effect on the pulse; he does not appear so much debilitated as he has done for some days past.

April 2. Four o'clock P. M. he slept well during the night, and felt very agreeably all the last evening; he took breakfast with appetite, but felt squeamish today several times; this sensation was always removed by taking a little wine, porter, or porter with alcohol. His countenance is pretty cheerful; he complains of pain in the breast, and also in the abdomen about the umbilicus; pulse 44, with frequent feeble beats or rather vibrations; 20 gtt. digitalis increased the strength, but not the frequency of the pulse, and the vibrations were nearly removed; the pains were immediately relieved; to take a pill to-night; in twenty minutes after he took the digitalis, he eat a bit of beef-steak, which seemed to have accelerated the pulse, but, in twenty

minutes more, the pulse was 44, strong and firm, without the vibrations; he now became drowsy.

4. He had an uneasy night between the 2d and 3d, with vomiting; the pill operated well; he has taken some food; he slept well last night; appetite much improved; he took the digitalis twice yesterday and once to-day, with beef-tea, wine, and porter containing alcohol; pulse 44; I now gave him 30 gtt. of digitalis, which did not immediately affect the pulsations.

5. He slept well, and was very comfortable last night; this morning he took the digitalis, and a little port wine, after which he enjoyed an agreeable and refreshing sleep. Four o'clock P. M. he is somewhat sick, which he attributes to some potatoe-pudding which he eat; pulse 46, very variable in strength; his countenance very pale; he took a little beef-steak, with porter containing alcohol, on which the sickness went off, and the countenance became cheerful; pulse still of the same number, with its beats almost all of equal strength, and continued so till six o'clock, when they became very strong, and still of the same number; 30 gtt. now given had no per-

ceptible effect on the pulsations; belly regular.

6. He slept well last night; he took 20 gtt. this morning, and felt himself very comfortable till dinner-time, when he took some soup with a little bit of beef, after which he became sick, and, notwithstanding some wine, &c. which he took, has vomited twice some of the fluid, but none of the solid. Nine o'clock P. M. pulse 44, weak, and pretty regular; I gave him 30 gtt. digitalis; the pulse immediately became very strong, beating 44, besides six weak beats per minute; in ten minutes, the beats began to diminish in strength, unaltered in number, and still with the intervening weak beats; belly regular; his health upon the whole seems to improve.

After this time, it was not in my power to watch the effects of every dose on this gentleman's pulse. He continued to take the medicine with apparent advantage for about a week more, when all the symptoms became worse than ever. His pulse was now 36, feeble and intermitting; and his body, instead of its athletic form, now resembled that of a delicate stripling. The use of the medicine was no longer persisted

in, but after this, he took nourishing diet and port wine without inconvenience; the cough had lost its severity; his bowels were pretty regular; his urine deposited a whitish sediment; his pulse rose to about 50 and feeble, and in this way, for some time, he seemed convalescent; but emaciation proceeded with uninterrupted pace; he afterward became frequently delirious and childish; his pulse was about 65, and feeble, and so continued till near the end of May, when one morning he felt himself free from all pain, his senses were sound, his countenance was pale, but the rays of hope imparted unusual animation to his eyes; he took wine freely, and even some animal food with apparent satisfaction, but his lips touched each other, and his tongue moved, not with the elasticity of life, but as if they were inanimate instruments of lead. The fascinating dream of recovery deluded him only till next forenoon. He was raising a glassful of wine to his mouth with complacency, when it fell from his hand; he seemed astonished and alarmed; he tried to lift a spoon that was near him, and found, that his fingers fell from the spoon before it reached his mouth. The charm was now

dispelled; despair appeared in his face; weeping like a child, he sunk in his couch; he became now regardless of the world and of life; his feeble pulse now varied from 90 to 120; colliquative diarrhœa came on, and he died without a struggle in a few days.

CASE III.

Mrs ———, aged 33, mother of one child, was tapped by Mr Arrindell, Feb. 7. 1805, and two gallons of a thick viscid fluid were evacuated. Her complaint began about two years before with excruciating pain in the right side, sickness and bilious vomiting in the mornings, &c. She had suffered all the routine of remedies for inflammatory affections of the liver, and subsequent dropsy; she had been vomited, purged, blistered, tapped, salivated.

Mercurial preparations in particular had been employed internally and externally, in great quantity and for a long time, but never were of any permanent advantage. About the end of the year 1803, the above enumerated symptoms had almost all left

her, but she had become very feeble, and continued so, and ascites seemed to be making rapid progress. She was first tapped in the beginning of May 1804, and has been four times tapped since. The catamenia had been suspended, but were now pretty regular. She lay with ease on either side.

20. She was tapped again, and about three gallons were evacuated.

That internal disease extensively infested the abdomen was evident, for, through its parietes, irregular indurations were perceptible to the touch in many parts from the scrobiculus cordis to below the umbilicus, and spreading latterly to the anterior and superior spines of the ilium; the largest of them commencing at the middle of the epigastric region seemed to occupy all the right hypochondrium and cover the kidney.

28. For some days the pulse had been varying from 70 to 90 per minute. This day, Mr Arrindell began the use of the tinct. digitalis. He gave her 15 gtt. in a wine glassful of cold water; the pulse was previously 88, but immediately after swallowing this dose, it became irregular, and, during the first three minutes, varied from

eighty to ninety-two beats, weak and strong alternately, but, at the end of three minutes, the pulse was 96 and stronger. Five o'clock P. M. pulse 92, full and hard. She complained of nausea and pain of back. Seven o'clock P. M. pain and uneasiness gone; pulse irregular, which it continued to be after she took other 15 gtt.

March 1. noon. Pulse varying from 76 to 80; in five minutes after taking 20 gtt. it varied from 82 to 86, and was stronger. Four o'clock P. M. it was still irregular, much more frequent and strong. Half past eight o'clock P. M. the pulse was 92, and regular; three minutes after taking 20 gtt. it was irregular and stronger, varying from 84 to 98; in fifteen minutes more it was 100; she now felt shooting pains in the abdomen.

2. noon. She had passed a restless night; pulse 80; 20 gtt. made it very irregular, but in twenty minutes the pulse was 88, and regular. Half past six o'clock P. M. the pulse was 96; she had been exerting herself a little, and complained of slight pain of back; 20 gtt. produced an immediate fluttering of the pulsations, which, in four minutes, varied from 96 to 108.

March 3. Previously to taking the drops, the pulse was varying from 80 to 88; immediately after, from 88 to 96, and stronger, without any fluttering. She is cheerful and much improved in her looks. Half past eight o'clock P. M. she slept this afternoon, and, on awakening, was affected with nausea; her pulse strong, varying from 92 to 104; drops not repeated. Eleven o'clock P. M. sickness gone; pulse much stronger than formerly, and 88 in the horizontal posture.

4. noon. Pulse previously 88; in seven minutes after, it varied from 88 to 96. Seven o'clock P. M. the pulse before taking the medicine varying from 96 to 100; in five minutes after, it was 104 in the horizontal posture.

5. noon. She had passed a restless night, had severe pain in her right side, and great thirst; such distressing symptoms continued for four days, and, in the interim, the quantity was increased to about ʒi. per diem.

9. One o'clock P. M. her pulse before taking the medicine 60; after it, from 52 to 60, and much stronger.

10. One o'clock P. M. the pulse was 54, and feeble; he gave her an increased dose, and, in eight minutes, her pulse was from 64 to 72, and full.

The digitalis was still continued for a week; the pulse never fell below 52, and was, for the most part, increased immediately by every dose.

Though after this time, the digitalis was occasionally administered to this patient, and uniformly with results similar to those above detailed, it would be unnecessary to relate the daily reports, as the intervention of many symptoms caused other remedies to be employed as palliatives, and rendered it difficult to judge what share each of them had in the changes that followed their administration.

The patient declared, that she derived more benefit from this medicine than from any other she had ever received since she was affected with the dropsy. This indeed appeared evident, for before Mr Arrindell attended her, she was not able to move from her seat, or bed; she was emaciated and feeble to the last degree; but a short time after, she acquired strength, and was able to go about her usual employ-

ment. Having had various health, she lingered to May 6. 1806.

That her case was both extraordinary and incurable, the following examination of her body after death will demonstrate.

An incision being made through the parietes of the abdomen, we saw, as it were, a vessel full of water, but no intestines; we found, that we had entered a cyst firmly and closely adhering to the peritonæum which invests that cavity, as far up as opposite the junction of the seventh rib with its cartilage, where passing transversely, it imitated in some measure the diaphragm; from within an inch of the left side of the linea alba to the top of the os ilium of the same side, and from the umbilicus to within an inch of the pubes, occupying a space of about a foot in diameter, large irregular protuberances hung into the cyst; the internal surface of the cyst was variegated with appearances of a red and white colour, the red evidently from blood effused, the white appearing to be the natural colour of the cyst, as it exhibited the same appearance in the parts separated by section, and on its external surface, where it

adhered to the parietes of the abdomen: there were many layers of coagulable lymph upon its internal surface, which coagulable lymph was also in great quantity in the fluid with which the cyst was filled. This fluid was of a dark yellowish colour, about the consistence of the white of an egg. There were small protuberances into the cyst on the left of the epigastric region, and large ones in the right. Other tumors extended from the linea alba to the termination of the twelfth rib, and occupied a considerable portion of the umbilical and lumbar regions. The cyst posteriorly exhibited an equal, smooth surface, as well as at the other parts not otherwise described; the cyst seemed even to fill the pelvis and line the cavity as completely below the ribs mentioned, as the peritoneum usually does. A cluster of tubercles on the left side of the uterus were evidently contained within the cyst, although the uterus itself, of its natural size and in situ, was excluded. The broad ligaments were obliterated. The cyst was a dense ligamentous substance about two lines in thickness, exterior to which were all the abdominal viscera.

The viscera in the space between the atlantal end of the cyst and the diaphragm were inundated with a fluid like serum, the omentum was puckered upward, and much increased with large abscesses, from which when cut, a quantity of matter issued very like that which was contained in the cyst.*

Present along with me, Mr William Back and Mr James Thomas Caines, students of medicine, and Mr Brown, surgeon and apothecary, Edinburgh.

CASE IV.

March 4. 1805. Mr ———, aged 36, a very tall man, by trade a mason, is greatly emaciated; his eyes are pearly white, his features sharp, face pale; he has high broad shoulders, short neck, and stoops much; his mind is remarkably despondent; he is much distressed by a cough, his sputa are completely puriform; he complains of some pain in the right side, though he lies with ease on either, and he has a sense of tightness across the breast; his inferior extremi-

* There is a case similar to this related in the Med. Obs. and Inq.

ties are œdematous. There is now beside him his son, aged 9 years, dying of phthisis pulmonalis, which had already been fatal to his other children. This man has laboured under various forms of this disease, for above three years. The means employed have afforded him transient relief, but never the hopes of recovery; his pulse is about 75, and feeble. Mr Arrindell prescribed for him the digitalis. He began by giving 15 gtt. thrice a-day, and wrote down whatever occurred. His cough speedily became more distressing, his breast more pained, his nights more restless. His pulse was immediately stronger, and daily, with little variation, became more frequent. Sometimes the dose quickened and strengthened the pulse immediately; at others, particularly after the medicine had been taken for some days, it produced no alteration. At one time it rendered the pulse more irregular; but, in general, this irregularity subsided and left the pulse more full and frequent.

In the mean time, his appetite was much improved, and vomiting, which formerly annoyed him much, had not attacked him. Febrile symptoms however, became more violent, and, about the end of a fortnight,

his pulse varied from 100 to 120, full and strong; for some days he complained of a headach, which was at length so severe, that we were under the necessity of employing the antiphlogistic treatment, by which it was removed in a few days; but, on renewing the administration of the digitalis, these inflammatory symptoms were reproduced with aggravation, and, accordingly, we no longer persevered in the prescription.

It now appeared certain, that the digitalis, taken in small doses, was a very powerful stimulant to the arterial system, and to the body in general, both in health and in disease; that it gradually induced febrile activity, on which, if the remedy was increased in the dose or even continued, an astonishing lowness of pulse and alarming debility ensued, and that its salutary effects were all produced during this state of activity, but that the consequent debility was fraught with danger.

SECTION V.

Shows, that the Digitalis may be successfully administered, and in such a manner as to avoid that Debility which has been reckoned its Proper Effect.

FROM these facts it was obvious, that, contrary to the general practice, the medicine should be administered in such a manner as to avoid the debility, which, I presumed, could be very easily accomplished; for, as its primary and salutary effects were febrile symptoms, it would only be necessary to intermit the use of the remedy, when these approached to violence. On this principle the following cases were treated.

CASE I.

May 29. 1805. Miss ———, aged 17 years, had scarlatina about five years ago, from which, she says, that she then perfectly recovered; about a year after, she was affected with sickness, coffee-coloured vo-

miting, pains in every part of the body, and difficult respiration; after these symptoms abated, the affection assumed the form of hysteria, and, for three successive months, she was affected by alternate paroxysms of excessive grief and immoderate laughter; she got bitters and other tonics; but has never since been entirely free from several symptoms of the above affections; she has been much harassed with sickness and vomiting, particularly after taking food, and, of late, has felt herself becoming daily worse; no food stays on her stomach; vertigo frequently seizes her to such a degree as to terminate in syncope; she has a sense of extreme debility; her mind is very depressed and anxious; her countenance and lips pale; eyes dull, and her appetite very depraved; she has no fixed pain in the breast or any other part, but occasional pain below the upper part of the sternum, and also occasional headach; she is sometimes attacked with a sort of spasmodic affection in respiration, which is always brought on by exercise, climbing or even walking up stairs; she has no difficulty in making a forced inspiration, but says, "that she feels as if she had no lungs to breath into;" an

obtuse pain and difficult respiration trouble her when lying on the right side; she has frequent cough with difficult expectoration of a thickish sputa, but was much more troubled with this two years ago, at which time also she often fainted; she has often, for these four years, had pains in the mammæ, particularly on pressure, which have become much more troublesome of late; she complains of frequent cramp and numbness of the lower extremities, and feebleness of their joints; catamenia have never yet appeared; the palms of her hands and soles of her feet are often very hot; she often has a disagreeable sense of heat over the whole body; her skin is in general dry, and she scarcely ever sweats, even on taking exercise to fatigue; her inferior extremities do not swell, though they did so toward night some time ago; her belly is regular, and urinary discharge natural; pulse 90, and feeble.

Ten o'clock P. M. 15 gtt. tinct. digitalis immediately strengthened the pulse. At half an hour past eleven o'clock P. M. pulse full, and 92.

May 30. Ten o'clock A. M. her looks are improved; she slept well toward morn-

ing, and on awaking neither coughed nor expectorated; she feels somewhat relieved and more lively; pulse about 90, and unequal; after taking 15 gtt. it was for the first sixth of a minute at the rate of 108; during the first two minutes 99 each, regular and equal; in forty-five minutes, pulse down to 90, and full; in the interval, she had taken some tea without bread. At half past twelve noon, after taking a walk and resting half an hour, her pulse was 108, regular and of natural strength; transitory headachs have troubled her this forenoon, but she thinks herself much better than yesterday. Ten o'clock P. M. pulse 90, regular and of natural strength. The pulse being sufficiently good, I did not think it proper to give her any more digitalis this night. She took dinner to-day with some appetite, and thinks, that she continues much better. I ordered, that she should go out in the morning and take some new milk in the fields.

31. Ten o'clock A. M. her looks are much improved; she has taken a walk this morning and milk; pulse about 80, and of natural strength; she must never, as she was wont to do, take tea without bread,

and, if the weather permit, she must walk every morning as to-day, and pay attention to her bowels.

June 2. Ten o'clock A. M. she fainted yesterday in the street; she eat a bit of veal to dinner, which, in half an hour afterward, was vomited; she was very sick, had severe pain at the stomach, headach and ringing in the ears; she did not walk yesterday morning, she slept well last night; walked, and took milk this morning; she complains of headach, pains of stomach and slight vertigo; pulse 96, and irregular. Two o'clock P. M. the pulsations were 120; they had been accelerated by walking, but sitting fifteen minutes reduced them to 96, feeble and irregular, and 7 gtt, immediately rendered them regular and stronger. Ten o'clock P. M. she took a bit of beef to dinner, and has not vomited after it to-day; has felt no sickness, and has been much better ever since she took the last mentioned dose of the digitalis; pulse 90, regular and of natural strength; she took to supper a small bit of beef-steak, and after it, a glass of wine, soon after which her pulse was 84, and of proper strength.

3. Ten o'clock A. M. she had no headach nor vomiting after supper, and slept well during the night; pulse from 96 to 102; she has taken tea and bread to breakfast, and is now affected with slight cough. About two o'clock P. M. her pulse being 78 and regular, 7 gtt. made it, in the first sixth of a minute, beat 20; in the first half minute, 47; in the whole minute, 90; in the fifth minute, 84 and variable; in the twenty-second minute, 86 and irregular; she has had no headach this forenoon nor ringing in the ears; has had slight vertigo, but by no means either so constant or severe as formerly; she has had no pain at stomach. Nine o'clock P. M. to-day she took some dinner of mild soup, a small bit of beef, and a wine glassful of brandy diluted with water; she felt very uneasy at stomach for some time after dinner, but did not vomit, and, in half an hour, became quite easy; she has been teazed with a tickling cough all the afternoon; pulse 79, pretty regular and distinct.

4. She was frightened in the morning, and has been unwell all day; she walked and took milk as directed, which was soon followed by sickness, pain of stomach and

vomiting; she took some tea and bread about ten o'clock A. M. felt very uneasy and asthmatical all the forenoon; about noon, of her own accord, she took 7 gtt. of digitalis which relieved her much. Four o'clock, she took some roasted lamb, potatoes and gooseberry tart with cream; after which she became very sick, was affected with swelling and pain at stomach, and vomited; since dinner, she has had several fits of dyspnœa with a sense of stricture in the breast, which was instantly relieved by a small quantity of nitrous ether. At nine o'clock P. M. she was labouring under a severe fit of this kind, sighing profoundly, and alarmingly oppressed. I gave her first about ʒi. of nit. ether in cold water, which immediately raised the pulse to 120, but it soon fell to 90, which it previously was; this relieved her but very little. I now gave her about double the quantity, which relieved her greatly, and the pulse instantly fell to below 90. It was about an hour before the attack entirely ceased, and it went off with sighing and yawning, leaving her pulse 90, and regular; her countenance and pulsations were the whole time pretty

natural; her face slightly flushed, and, at no time, asthmatically livid.

5. She slept ill during the night, but got some sleep in the latter part of the morning; she did not walk this morning; took breakfast of tea and bread about ten o'clock, and has been pretty well this forenoon; her looks are improved. Ten o'clock P. M. pulse 106, feeble and irregular; she took 10 gtt.; in ten minutes after, her pulse was of the same number and regular; second minute, 100; third minute, 102; fourth minute, 100, and stronger; sixth minute, 106, and still strong; seventh minute, 100; eighth minute, 104, and still strong; thirteenth, fourteenth, and fifteenth minutes, it varied from 98 to 104, and was as feeble as before she took the medicine. Eleven, P. M. she took some dinner of boiled beef, and, after it, a small quantity of brandy and water, she felt sickish and had a slight headach which went off in about half an hour; she took tea, bread and butter about six o'clock P. M.; pulse now 66, and regular; her looks cheerful.

6. She felt very well during the night; rain prevented her from walking this morning; she took breakfast with some appetite,

and has no complaint. Eleven o'clock A. M. pulse about 87, and irregular, but not feeble; she had been walking a good deal. Two o'clock P. M. pulse 78, regular and of natural strength. Eleven o'clock P. M. she continued well; took some soup and beef to dinner, which made her a little uneasy, but this soon went off, and she has taken food since without inconvenience.

June 7. Ten o'clock A. M. she took an airing and new milk this morning; feels herself active and without complaint; pulse 90, regular and of natural strength. She slept very well last night. Ten o'clock P. M. she took some fish and roasted lamb to dinner, and a small quantity of brandy and water after it, which was followed by no inconvenience; she has taken other food in the afternoon, and thinks herself in perfect health; pulse 80, regular and of natural strength.

February 3. 1807. Remains well.

CASE II.

Mrs ———, aged 30, became ill on 2d February 1806. She has fair hair, light

blue eyes, delicate countenance, slender form. I visited her first on the sixth day of the fever, which, in that time, had reduced her very much. Her pulse was feeble and quick; petechiæ were over all the body; her mouth was sore and lined with sloughs; next day she seemed better, but a slight insidious cough, which had not yielded to vesication, began to be more severe and frequent; in two days more, dyspnœa and smart febrile symptoms were superadded.

On inquiry, I found that she was very subject to catarrhal affections in winter, frequently complained of pains in her sides, particularly after fatigue from bodily exercise, and had always been troubled with a slight cough.

Vesication was again resorted to, but without affording more than a momentary relief. Her bowels were regulated by gentle laxatives, as pulv. rhei palmati; she took beef-tea containing supertart. potassæ instead of common salt. The disease became rapidly more formidable; her stomach refused wine; stools were of the colour of venous blood; urine scanty; she was suddenly raised from sleep by starting and dread of instant suffocation; she could not

lie, but persons supported her in the sitting posture; her eyes were dull, her face livid, her looks anxious, and the cough attacked her frequently in very rending fits, and was followed by a copious viscid expectoration. The heart pulsated as if it would burst the thorax; the pulsations at the wrists, temples and ankles, were about 130 per minute, and irregular; the whole under extremities were spasmodically affected, kept in a state of extension, and occasionally were excruciatingly pained about the ankles, but the pain was always removed by applying alcohol to them. She was so ill one morning about one o'clock that it was thought she could not live many hours.

The accession of the symptoms was in the space of five days, and nearly in the order of their detail. I was under the disagreeable necessity of answering to the anxious interrogatories of an attentive husband, that this lady's situation presented but few hopes of recovery. Large blisters had all this time been kept open on her breast, and had discharged freely. I now prescribed a mixture of the tinct. digitalis purpurea, to be given every three hours in portions containing about 12 gtt. each.

I informed the husband, that this was a very active remedy; instructed him how to feel the pulse, and told him that if sickness, vomiting, languor, or diminution in the number of the pulse came on, to discontinue the remedy. Next morning, her breathing was much easier; she liked the mixture well, and sought it; she had taken some food; had made water pretty freely during the night; had enjoyed some sleep, but could not deviate from the sitting posture; pulse 130, full, strong and regular; the beating at the chest was not now so forcible. The husband told me, that he found the pulse quicker and stronger every time that he gave her the medicine. I now gave her one dose which first produced a certain irregularity in the pulse, but, in the space of one minute, it was regular and 135. This medicine was continued, in the same manner, for three days more, during which time the pulse increased in force and frequency, and at the end of it, she could lie with three pillows under her head; all the symptoms were much relieved, but the pulse now beat 150, and strong; I hesitated whether I should continue the exhibition of the di-

gitalis, but reflecting that its power of promoting absorption was always in proportion to the activity which it caused in the sanguiferous system, I ordered it to be continued as formerly. Next day, the breathing was easy, the mind cheerful from dawning hopes of returning health, the pulse was diminished in number and somewhat irregular; she desired some food and eat a bit of fowl with some relish; her limbs were still in the spasmodic state; her stools coffee-coloured; blisters still open; cough hard, dry, frequent and severe. I ordered the digitalis to be taken during the day, but not in the night. On the following morning, she had suffered a little from sickness, and, when I saw her, the pulse was irregular, intermitting and not exceeding 110; the cough nothing relieved. I ordered her to inhale the steams of vinegar and water, to take light nourishment, &c. but no more of the mixture. Her stools had not assumed a natural colour, nor had the spasmodic affection subsided; her urine was of natural quantity, but red coloured, containing sediment of the same colour. She remained in this state for about two days when the febrile symptoms returned, with aggrava-

tion of the cough; pulse about 140, quick, sharp and irregular; the movement of the heart was so forcible, that it was not only felt by herself, but was perceptible to persons in the same room; she could lie on her back, or on either side; felt burning pain under the sternum; her face was of a florid red; her mind incoherent and sometimes delirious. One easily saw the impulses of the arterial blood in the wasted and collapsed temples, and in the carotids of the long and emaciated neck; the pains of the stretched limbs were renewed. I put a large vesicatory on the sound part of the thorax, and pushed the antiphlogistic plan as far as I could venture to do in a wasting skeleton covered with skin and possessing animation. On the second day, the violence of the symptoms relaxed, and the countenance exhibited the most awful resemblance of death that I ever beheld in a living being; the pulse at her wrists, &c. was feeble and irregular; I could not ascertain its number; the heart still beat forcibly; the pain of the chest was almost gone; she had been often seized with heaving of the chest, and faintings during the night. Though I did not expect, that

she could possibly live more than a day, I directed, that she should have some beef-tea, and a glass of port wine containing about ʒi of alcohol, alternately during the day, so that she got the wine and alcohol every two hours. The following day, I was surprised to find her much better, and to be informed, that her senses were pretty sound after I left her; her urine deposited a white sediment; the stools were still dark; the cough was now much less severe, and brought up a great quantity of purulent ill-coloured sputa; pulse about 120, and feeble; wine, &c. to be continued as above directed. In the course of this day she relapsed, the delirium returned, the breathing again became very difficult and noisy, which it had not been before; the lips were very pale; the pulse scarcely could be counted on account of its irregularity, though it was perceptible to the touch at the ankles, wrists and temples; the motions of the heart had again become worse, and were between 120 and 130 per minute; some parts of the chest, which had healed, were to be blistered again, and wine, &c. to be given at any time. On the next day I found, that the blister had risen well, but

had not afforded much relief; pulse as yesterday. I resumed the mixture containing the digitalis, and ordered a dose containing 20 gtt. to be given every two hours. I visited her after this thrice a-day; at nine o'clock A. M. two o'clock P. M. and at midnight. On the evening of the first day, the pulse became distinct at the ankles, wrists and temples, beating irregularly about 130, but synchronous with the heart; already also the breathing was relieved, and the sputa came up with greater ease. The following morning she was very feverish, skin hot, tongue somewhat dry on its upper surface; motions of the heart not diminished in force; pulse about 140, and strong; she was delirious and incoherent when drowsy, but, when roused, her judgment was sound. The medicines were exhibited in the same way for three days; the pulse continued strong as above, but, in other respects, she became rapidly better; the heart beat with less force; she called for food, and took some beef-tea and wine with pleasure; the sputa became gradually less copious and thicker, resembling healthy pus mixed with mucus; stools began to be lighter in their colour; urine nearly natural with scarcely

any sediment; the spasmodic affection of the extremities began now, for the first time, to relax. On the morning of the fourth day, after the resumption of the digitalis, the pulse was intermittent, and not above 120, sometimes beating even below 100. I ordered the digitalis to be discontinued, and by following this with wine, tinct. cinchonæ, scilla maritima, myrrh, &c. as circumstances required, she had a complete recovery in the space of three months from the first attack of the above described succession of diseases.

CASE III.

Mr ———, I was called to this gentleman 22d March 1806. He had an œdematous swelling from the knee downward, caused by a sprain and bruise which the limb had sustained four months before. At this time it was enormously swelled and pitted on pressure; the skin of the limb was like dried parchment, and scaly; a crowd of red spots covered it, from which a serous fluid issued; he was pale and much dispirited. This was a man of superior judg-

ment, who had, during his whole life, enjoyed a good constitution, and was a pattern of temperance, moderation and diligence. Some years before this, he had a cuticular affection, which was completely removed during a visit to one of the watering-places in England. Friction with various ointments had been employed for the present affection, but discontinued because it always produced excoriations and ulceration.

An open sore, however extensive, is much less dangerous than such a swelling; it therefore appeared to me of the first moment to remove the œdema, and to restore the tone of the limb, as local mortification or general dropsy might supervene and prove fatal. The limb was in eight days reduced nearly to its proper size by bandaging; through the cuticle a great quantity of fluid was discharged daily, and a great part of the limb was denuded and gave great uneasiness. I dressed the sores with a liniment containing tinct. opii and sp. ammoniæ, which I had often found powerfully to promote the healing of watery sores; the serous discharge was merely moderated by it on this occasion. He took very nourishing diet, and, according to pre-

scription, nearly two pints of claret per diem. In order to obviate this dropsical tendency, I gave 10 gtt. of tinct. digitalis in a glassful of claret thrice a-day. His pulse, since I attended him, had been about 70, and feeble; the digitalis raised it to 90, and strong, and, in four days, arrested the serous exudation; at this time the exhibition of the digitalis was stopped, because many inflammatory symptoms were evinced; his face was flushed; he was restless during the night, and affected with slight headach; pulse 100, and strong. He was now allowed very little claret, no animal food, and was freely opened by laxatives, notwithstanding which, the inflammatory action continued nearly a week; gradually, in the mean time, the limb received a new healthy cuticle, and had nearly resumed its proper size. The pulse, in about eight days, came down again to about 70; the limb continued to acquire strength, and we entertained hopes of a speedy cure. The regimen was now continued the same as before the administration of the digitalis. In the course of a fortnight the pulse began to rise again, and this was accompanied with other slightly febrile symptoms, which

were not subdued by a pretty strict antiphlogistic treatment. This was one of the innumerable proofs, that an education, at once medical and surgical, is indispensably necessary to him who practises the healing art. In a few days, a very distressing papulous eruption broke out over all the body, but particularly the back, on which not half an inch of sound cuticle was perceptible. This rush becoming watery was anointed in the same way and with the same substance that had been applied to the limb, and with no greater efficacy. I proposed to the very intelligent and ingenious Dr Cleghorn, who was called into consultation, to try the digitalis. He objected to it on account of the very feeble state of the patient, and the remarkably debilitating properties of this medicine. I took the liberty to inform him, that the common opinions with regard to the powers of this substance, as I had satisfied myself by observation, were erroneous. The remedy was accordingly exhibited. I gave him 15 gtt. thrice a-day. The pulse had for some days been from 90 to 100, feeble and irregular, but, after taking the third dose, it was about 120, and full. In three days, this watery exudation was

completely removed. The eruption continued to be anointed chiefly with the same liniment as before; the citrine ointment and a liniment containing the nitric acid, were also tried, but they were more severe and less useful than the former.

This eruption being inexpressibly distressing, I was happy to observe that it began to disappear and the skin to heal. Shortly after this, I was called from Glasgow on an urgent occasion, the same treatment however, was continued, and the gentleman got well.

If I had been then as well acquainted as I now am with the effects of the tinct. cantharidum, used internally, for the cure of watery cuticular eruptions, these complaints would have been removed speedily, and with very little or no pain to the individual.

CASE IV.

Mr ———, aged 28 years, a man of a spare figure, irritable temperament and acute mind, one of those printers called compositors, was, in the end of October 1806,

affected with pain in the wrists, seated seemingly in the first row, or, as Dr Barclay would more correctly say, in the proximal row of the carpal bones, whence the pain darted upward as far as the shoulder, and, on account of it, the hands and fingers could not be moved. The left hand was, at first, most severely affected, it swelled much and became œdematous. A slight degree of fever and very great irritability were present. The pulse was, in general, about 80, sharp and irregular. Pressure on the diseased parts produced extreme torture, which was terminated by fainting.

During a mild antiphlogistic regimen, and vesication of the back of his hand and wrists by the meloës vesicatorius, the pain gradually abated, and the limb returned to its healthy state.

Next, the other wrist and hand, which had been but slightly uneasy for about three weeks from the commencement, began to take the same troublesome course; this limb was treated in the same way, and the pain of the wrist was, in three or four days, very much alleviated; an enormous œdema supervened, and it was thought, that puncturing would be necessary to prevent

the bursting and sphacelation of the integuments; pulse about 80, and feeble.

In the mean time, to the more formidable external operation, I preferred the internal use of tinct. digitalis, of which, conveyed in water and simple syrup, he took 15 gtt. night and morning; this raised the pulse to above 90, and strong, and, in the space of five days, completely removed the œdema; the integuments became shrivelled like a dry and emptied bladder.

A cure however, was not thus effected, for the pain in the same wrist now returned with as much violence as ever; the use of the digitalis was discontinued, and vesicatories again employed, with cathartics and low diet.

On the evening of the second day after this, I was called to him, because he thought himself in the greatest danger. His pulse was uncommonly strong and beating 114 per minute; his looks were anxious; face flushed; respiration interrupted, short and painful. This afternoon he was seized with an inexpressibly acute pain of the left side, which preceded the symptoms just mentioned. He was, he said, somewhat subject to pains of the side, and, some years be-

fore, a pain, which distressed him, had been removed by venæsection. Since last visit, he had taken four powders, each containing ʒiss. of the compound powder of jalap, which had not moved his bowels in the least. The pain of the wrist still continued, though the blister discharged copiously. ʒxvi. of blood, which exhibited the buffy coat, were now abstracted from the arm; this gave him instant relief. He was ordered to repeat the powders, one every six hours, till his bowels were freely opened.

Next day he continued easier, but still felt the pain of the side, and was sick at stomach; he had taken other three powders, which had only produced one scanty stool. He was now ordered two powders containing each one scruple of jalap and five grains of the submuriat of mercury; the one to be swallowed six hours after the other if necessary, which two, and the same quantity on the second day after, were taken, before his bowels were freely opened. This free purgation at length removed the pain of the side, and the œdema of the affected limb, but not its pain.

This pain however, daily diminished, while the œdema returned, and, in the be-

ginning of December, was very great. As the pulse was now reduced to about 70, and every symptom of inflammation absent, he resumed the digitalis in smaller doses than formerly, which, in a few days, rendered the pulse full and about 90, and removed the œdema. From this time, he began to use his right hand again, he rapidly recovered his general health and the use of his hands, and is now (June 4. 1807.) almost as well as ever he was.

CASE V.

January 20. 1807. Mrs ———, aged 51, a slender active lady, the mother of many children, of pale complexion, in general very healthy, has suffered much from distress, grief, fatigue and family misfortunes. Her menstruation had ceased some years ago, on which occasion she was long very delicate and ailing. Of late, though she could scarcely complain of bad health, she was very feeble, and was, for some days, surprised, that her feet were very tight in her shoes, and her legs in her stockings. I found them much tumified with an œde-

ma; pulse about 110, feeble and irregular. I ordered her to keep her bowels regular, use nourishing diet, take 12 gtt. tinct. digitalis in a wine glassful of cold water thrice a-day, bandage the limbs from the knees to the toes, and bathe them with brandy.

22. Œdema nearly gone, appetite good, pulse 120, pretty full and regular. Same regimen continued; to take 15 gtt. thrice a-day.

26. She complains of some headach and squeamishness; œdema gone; face flushed; pulse 120, and, in strength, resembling the pulse of inflammatory fever. To continue the same regimen, but discontinue the digitalis; the urinary discharge was now much increased in quantity.

Feb. 8. She has been much troubled with pains in her bowels, and a sense of weakness to-day; no return of the œdema. To take a laxative, and wine diluted with water and sweetened.

10. She was relieved by the operation of the medicine yesterday, and is pretty well.

June. She continues well.

SECTION VI.

Communication on the Powers of the Digitalis, from Mr J. De Courcy Laffan, one of the Presidents of the Royal Physical Society of Edinburgh.

DEAR SIR,

THE elaborate and circumstantial view (with which you have favoured the Royal Physical Society) of the modus operandi and effects of digitalis in the cure of disease, was sufficient, I own, to rouse the attention of every member, and call forth such a spirit of inquiry as the evident importance of the subject demands; and would probably have led to the full establishment of your opinions in the minds of many in the society, had not the effects of this drug been confidently stated by men of known experience and of considerable fame, who, viewing its medicinal properties in a different light, held an opinion directly contrary to that which you would have us adopt. You could not therefore, wonder to find me in the number of those who received your doctrine, if not with incredu-

lity, at least with particular caution and some deductions. As digitalis however, had been announced to the world as possessing powers nearly specific in curbing the ravages of phthisis, I resolved to examine the data on which the prevalent opinion of its virtues was founded.

On consulting every work which I could procure, from that of Fuchsius * down to those of the present day, I perceived, that the opinions, which medical men had formed, of the properties of this plant, were so various, so opposite and so contradictory, that the question remained to be decided by new observations; of which I was the more satisfied, when I found a Hamilton, a Beddoes, and a Kinglake, opposed by a Currie, a Ferriar, and a Drake.

Accordingly, in conjunction with Dr Lee, and several other gentlemen, who, uninfluenced by any theory or preconceived opinion, were desirous to satisfy themselves with regard to the medicinal properties of digitalis, I conducted a number of experiments too tedious for detail, of which the following were the results.

* Hist. Plant.

First, That digitalis, taken by a person in health, raises and maintains, *for a certain time*, an increased force and frequency of pulse. *Secondly*, That this action increases but not in the direct ratio of the quantity of the medicine taken. And, *lastly*, That it, in many instances, produced a sedative effect apparently greater than what we could expect from the preceding excitement. Shortly after this, several opportunities occurred to me of proving its effects in disease, and I found, that small doses generally raised and maintained an increased action, under which morbid effusions were removed from *many* cavities of the body, and sores assumed a healthy appearance; the evacuations by the skin and urinary organs were increased, while the pulse acquired a greater fulness.

I have thus endeavoured to lay before you the result of my limited observations, without attempting to account for the various and contradictory opinions which, with respect to the effects of this medicine, have progressively swayed the minds and directed the practice of physicians for a number of years.

This subject has excited the public attention, and it is with no small degree of anxiety, that the determination of the question is expected; for who can be indifferent on a point that involves the safety or destruction of thousands of his fellow-creatures? I am yours, &c.

J. De Courcy Laffan.

Edinburgh, Nov. 3. 1807.

CHAPTER II.

THE FACTS ASCERTAINED CONCERNING THE OPERATION OF THE DIGITALIS APPLIED TO THE EXPLANATION OF THOSE CIRCUMSTANCES WHICH HAVE LED TO THE MISTAKEN OPINIONS PREVALENT ON THIS SUBJECT; AND THE NEW PRINCIPLE FOR THE ADMINISTRATION OF THE REMEDY FURTHER ILLUSTRATED.

SECTION I.

Operation of Digitalis, with some Observations on the Nature and the Manner of Action of those Powers which maintain the Vital Phenomena.

IT has been demonstrated, that each small dose of the digitalis taken by a person in health, increases the force and frequency of the pulse; and if the doses are repeated, that they will induce an inflammatory action of the system; that also in disease, the first effects of digitalis exhibited in small doses, are to increase the force and frequency of the pulse; to excite and maintain that degree of action during which

sores assume the action of healing; to promote the process by which effusions are removed from any of the cavities or parts of the body; to enliven the mind and improve the powers of voluntary motion; to invigorate digestion and increase the evacuations by the skin and by the urinary organs; in the mean time, the pulse is gradually attaining a febrile activity, so that from 70 or 90, if the use of the medicine is incautiously persevered in, the pulse shall be raised in a short time to 120, 130, or any number between these and 150.

The stomach begins to be disordered, giddiness, beating of the vessels of the head, restlessness, general uneasiness, heat, and pains in different parts of the body, are superadded.

Though the use of the medicine is now discontinued, these febrile symptoms may continue undiminished for four or five days; generally however, in the space of twenty-four hours, and often much less, after their accession, the pulse sinks to 120, 110, 100, very irregular in the repetition and strength of its beats; the pulse sinks still more; the mind droops; oppression about the præcordia and nausea are very

severe; vomiting is added, but gives no relief; at this time there are often an increased flow of saliva, diarrhœa, a very copious discharge of limpid urine, and considerable clammy moisture of skin, or even profuse sweating; the countenance is pale and characteristic of despair. The patient may continue in this state for one, two, or even four hours, when all the distressing symptoms abate; but the pulse does not rise immediately again, but will continue to sink, and in a few days will be down to 50, 40, or even 30, and perhaps lower: this series of events I myself have witnessed; but much worse than those are recorded by Withering, whose treatise on the fox-glove is a valuable specimen of truth and candour.

With regard to the pulse alone, during the use of the digitalis, we may observe, that its beats are gradually increased in force and frequency for some time, after which they speedily sink below the usual medium of health, and this increase and diminution follow sooner or later in proportion to the quantity of the medicine and the excitability of the system.

The increase of force and frequency in the pulsations is greatest and most rapid

during the use of digitalis in persons predisposed to, or affected with active local inflammation, and most speedily when either parts, previously sound, or those ulcerated, are proceeding, or are brought back to healthy suppuration, in which instances the digitalis and disease act with united violence.

In persons, on the contrary, affected with dropsy or collections of matter from degenerating ulcers, the pulse is invigorated, rendered steady, and, diminishing in number, returns toward the standard of health in proportion as the effused fluid or puriform matter is removed; but this diminution is very different in its nature from that which succeeds the too liberal or too long continued use of the medicine, the former is the effect of the irritating cause being removed, the latter of the powers of life being exhausted by its action; the one salutary, the other pernicious.

When the system is in a complete state of asthenia, or when the phlogistic diathesis has been entirely subdued by the abstraction of blood, the digitalis does not, previously to the diminution of the number of the pulse, produce that great accelera-

tion of beats with the inflammatory violence which is above pointed out: a person in such a state, and dropsical, with his pulse from 120 to 130, feeble and irregular, may be ordered to take from 10 to 15 gtt. thrice a-day, with this precaution, to discontinue their use if headach or sickness supervene; at the end of eight days, the health will be improved, the swelling diminishing, and the pulse 120, 130, or even more, strong and regular; at the end of a fortnight, we shall find the dropsical swelling of the abdomen and limbs removed, all the vital and animal functions invigorated, and, though none of the symptoms of debility or exhaustion have intervened, the pulse reduced to about 72, and full; in pneumonia likewise, after the pulse has been reduced to between 80 and 90, and the phlogistic diathesis completely subdued by venæsection, great breathlessness and debility are experienced; during the use now of a few drops of the tincture of digitalis given twice or thrice a-day, the vigour both of the respiration and of the general system will return, and in the course of six or ten days the number of pulsations will be increased to between 100 and 110; when neither preceded nor

accompanied by any disagreeable symptoms, they may speedily diminish to between 50 and 60, strong and irregular.*

Concerning the operation of substances in general on animate bodies, it is not perhaps improper here to observe, that certain substances or powers which influence the animal body, act more conspicuously on one organ or particular set of organs than the rest, and this fact suggested the principle on which the articles of the materia medica have been systematically arranged: hence emetics, cathartics, diuretics, &c. hence also the notion of specifics.

This fact however, though it must have always been partly perceived and recognised, has never been considered in its full extent; for, on a more close view of the phenomena of animal life, it will be found, that there is scarcely any one substance or power which influences the body, but acts more conspicuously on one organ or particular

* There are many very useful observations on the powers of digitalis, in a very ingenious Treatise on the Origin, &c. of Consumption, lately published by Dr John Reid of the Finsbury Dispensary, London. I would have frequently availed myself of this author's remarks, had I seen his Treatise while I was composing this Work.

set of organs than on the rest, or, in short, produces effects peculiar to itself: thus, light, on the eye; odoriferous and sapid bodies, on the nose and palate; the will, on the voluntary muscles; shame, on the capillaries of the face; fear and grief, on the heart and respiratory organs; all the fluids of the body, on the vessels which contain them.

Partial views of this fact, have served as a basis to many ingenious, though absurd hypotheses, as the spasms of Hoffman and Cullen; the reverse sympathies of Darwin; and the animal, organic and proper lives of Bichat, which is nothing more than a revival of the opinions of Paracelsus.

From another view of this fact, certain substances have been denominated stimulant, and these have been divided into permanent and diffusible.

The opinions, however wild or fanciful they may occasionally seem, which have prevailed from the most remote antiquity, concerning the immediate agent of vitality, are astonishingly similar to each other; we can scarcely discover any more than diversified repetitions of the same idea.

That the opinions of the moderns should resemble those of the ancients, is not surprising, when we consider the enthusiastic veneration for the works of Cicero, which animated the restorers of literature in the western world; but that the sentiments of all men in every age should not differ from one another on a particular subject, seems to be solely attributable to this, that they are fundamentally warranted by the truth of nature.

I have long believed, that, divested of the varieties of expression, these opinions might be thus reconciled with one another, and with the peculiar events to which they are referred; that the phenomena of life are immediately produced by a certain unique power, somehow immediately connected with the brain, supplied by the nerves to all the parts of the body conjointly and individually; that this power is generated in the body itself; varies in its properties; is modified in its effects according to the structure and changes in the structure of each part or organ; and is directed to all, but more forcibly to any one part of the body, according to circumstances; that any other substance or power acts solely through the

medium of this one, which is the only direct cause of the phenomena of life.

That this power, in a certain state, is partly or wholly contained in, or conducted by every substance which is said to act on animal bodies so as to cause the phenomena of life, and is communicated from them, and conveyed by appropriate organs to the brain, where it receives its proper formation, and is thence distributed by a distinct set of organs to the different parts of the body. Thus, we know, that the power which causes sensation or the operation of intellect proceeds toward the brain, while that which causes muscular motions proceeds from that organ.

This notion, which, if verified, would not only change many generally received opinions, both in physiology and pathology, particularly concerning sympathy, and the operation of substances on the system either externally or internally, but would destroy the doctrine, that poisons must be absorbed before they produce their peculiar effects on the living body, I shall endeavour to elucidate hereafter; in the mean time, I affirm it to be, so far as I now remember, a law of the animal economy, that every

power which induces vital phenomena, while it influences the whole body, affects some function or functions more than others. Thus, lead affects the nerves; mercury, the secretion of saliva; cantharides, the urinary organs; opium, the imagination; digitalis, the blood-vessels.

SECTION II.

Opinions of Authors examined, and their Inconsistencies pointed out.

THAT, during the use of digitalis, the pulse is first increased in force and frequency, and next sinks suddenly to a very low degree, is in direct opposition to what is generally believed and taught.

It is maintained, that digitalis is a direct sedative, or, in other words, that, when received into the system, its proper effect is to diminish the force and frequency of the motion of the circulating blood.

We shall here consider some of the facts detailed by the best of those authors who have written most fully on the powers of digitalis, to see whether their accounts will warrant this conclusion, which seems to have been universally adopted.

To warrant this conclusion, it would be necessary to show, by cautious observation, that the pulse diminished both in the force and frequency of its beats immediately when the dose of the digitalis was taken,

and continued to fall during its use; that it is most useful in persons of the phlogistic diathesis, labouring under diseases of the most inflammatory nature, and during the rage of inflammatory violence; that it should not be administered along with substances decidedly of a stimulant nature.

That the doses of digitalis do not immediately and successively from the commencement of its use, diminish the force and frequency of the pulsations, is evident from the rules that are given by authors for its administration; as, "let the use of the substance be continued till it produce its peculiar effects;" "it was used such a length of time before its effects on the pulse appeared." That it has no such effect is also proved by the cases which they relate: "The remedy," (*i. e.* the digitalis) says Ferriar,* "seemed in many instances for a while to retard the progress of the disease, but the symptoms at length burst out, and seemed only to proceed with more rapidity in consequence of the transient delay," why not in consequence of the digitalis? and, "the remedy was given in small doses, but for some time

* On Digitalis, p. 20. and 23.

without any sensible effect. The pulse continued rapid, night-sweats came on, the cough increased in violence, pains in the hypogastric region were felt." After this he increased the dose to two grains and a half every day. "The effect on the pulse," says he, "now took place; it was reduced to 86." What was the cause of the previous aggravation of symptoms?

Are not the phenomena of this case in perfect conformity with the previous increase, and consequent diminution of inflammatory action? He says, (page 36.) "The vigour and steadiness of the pulse increased exactly in proportion as the water was withdrawn from the cellular membrane."

In the cases of Dr Kinglake, we find, that the digitalis was administered for a considerable length of time, even for weeks, without diminishing the frequency of the pulse; and the invigorating powers of it are variously expressed by every author who has written on the subject. This physician, speaking of a patient who had been taking digitalis from the 21st of August to the 13th of October, says, "The pulse held uniformly at 90, and was affected only in

being changed from hard, small and weak, to soft, full and firm, *an alteration which appears to me to be a condition* sine qua non *of the beneficial effects of the medicine.*"

I fear, indeed, we shall no where find much consistency between what has been asserted and related in the works of authors concerning the operation of digitalis.

Ferriar asserts, (p. 5.) "That the pulse may be reduced from 120 to 75 or 80, without danger, at the will of the practitioner;" while in his cases we have found that, during its use, the inflammatory symptoms proceeded with incontrolable fury!

"Under the administration of digitalis," says Dr Beddoes,* "the frequency of the pulse was *always* diminished, but still the dilatations of the artery in a given time would have communicated much more motion." But in p. 207, he says, "I have known digitalis occasion an increase of the pulse from 76 to 120, with heat of skin and headach." And, (p. 219.) we find, that "digitalis increases the action of the arterial system, is a stomachic, soporific poison, like opium, and powerful stimulant;" but

* On Consumption, Digitalis, &c.

(p. 220.) that " certain properties are so combined in the digitalis as to give it its *common, but by no means constant, power of reducing* the frequency of the pulse." Who from such data could conclude any thing certain, except that the authors had no correct knowledge of the subject on which they wrote?

In fine, we are informed, that " digitalis shall be taken daily for a considerable time without producing *any effect*, till, all at once, the most dreadful exhaustion ensue, accompanied with enormous diminution of the pulse, nausea, vomiting, and a most oppressive sensation about the præcordia."

Is it not repugnant to every thing that our mind is capable of conceiving, that a most powerfully deleterious substance, one half grain of which is said to have produced the most direful effects, should be so capricious in its operation as to be received into the system daily for a considerable time, and then, by one assault, like a lion darting from his concealment, fiercely attack the unwary victim?

The habit of body fitted for the reception of digitalis, is not the robust or the phlogistic, as Dr Beddoes hypothetically

supposed; this we may learn from the observations of Dr Withering, which are deduced from long experience independently of hypothesis.

"It seldom succeeds in men of great natural strength, of tense fibre, of warm skin, of florid complexion, or in those with a tight and cordy pulse. On the contrary, if the pulse be feeble or intermitting, the countenance pale, the lips livid, the skin cold, the swollen belly soft and fluctuating, or the anasarcous limbs readily pitting under the pressure of the finger, we may expect the diuretic effects to follow in a kindly manner."

Hence we learn also, that the diseases in which it is most conspicuously useful are not of the active inflammatory kind, but those of extreme debility, as in dropsies, chlorosis, &c. Nor is it useful during the violence of inflammatory action, as the passages which we have quoted warn us; and authors order its exhibition in hæmoptysis to be preceded by the copious abstraction of blood. These subjects, however, I shall afterward resume in a work on dropsies, hæmoptysis, &c.

We find in authors, that it is administered beneficially along with preparations of the most active nature, as of opium, camphor, assafœtida, iron, mercury, &c.—Are these also sedatives?

Of what value then is an opinion concerning the powers of a substance, not warranted by experiment, nor by the facts related by those who have promulgated it; not corroborated by the state of the body which receives the substance, by the nature of the affections which it removes, nor by the acknowledged properties of the medicines along with which it is administered?

No wonder, that physicians are often so grievously disappointed in the effects for which they prescribed the digitalis, and that it is deemed a precarious and desperate remedy: who would be surprised, that a traveller, unguided by the magnet, was bewildered in the trackless regions of Siberia?

SECTION III.

Endeavours to show those Occurrences which misled Physicians in forming their Opinion concerning the Powers of Digitalis.

IT is however, far from my intention to impeach the veracity of those most respectable authors; on the contrary, I affirm, that their cases, though not circumstantially, are, in my opinion, very fairly related; I only contend, that their inferences are inadvertently formed, and I think, that I can point out the chief circumstance which led them into the notion of the peculiar direct sedative properties of digitalis.

Physicians had not been accustomed to conceive, that any substance whatever could excite the symptoms of inflammatory fever, and that a diminution of the force and frequency of the pulse would ensue as a consequence; therefore, during the use of digitalis, when inflammatory symptoms occurred, they attributed these symptoms to the disease; but the depression of the vital phenomena which supervened, they deem-

ed the peculiar effect of the operation of the remedy.

They may have been deceived also by observations on the pulsations of persons extremely debilitated: for when, from mere depletion, as from the loss of blood, &c. the body is very much debilitated, and the pulsations are exceedingly rapid and feeble, all stimuli diminish their number, by increasing the force and duration of arterial contraction. What physician has not observed in typhus, that a few glassfuls of wine have diminished the number of pulsations by 20 or 30 per minute? nay, I would ask, what man is there, who watches the phenomena of disease, or is acquainted with the effects of those accidents to which our bodies are daily exposed, but has, in almost numberless instances, witnessed similar effects on the pulsations from the administration of strengthening remedies?

In similar circumstances the digitalis will, more conspicuously than any other substance, diminish the number of arterial contractions, and invigorate all the functions. I may here however, add, that very rarely, in any state of constitution, does the digitalis not instantly when taken accele-

rate the pulse; we shall find, that a few drops in the morning will instantly raise a weak pulse from 110 to 120; and that the same pulse will in the evening be as low as 70; this event occurred to my notice in asthmatical affections which I supposed to arise from œdema of the lungs.

The phenomena of the pulsations during the administration of digitalis in dropsical affections, may have also contributed to the belief of the sedative virtues of this substance.

When a watery effusion is collected in any of the cavities or parts of the body, it becomes, in some degree, an irritating cause, but when in the thorax, it most remarkably accelerates the pulsations; after this effusion is removed by any means, the pulsations will diminish in number; this I have often observed, but it is not the effect of the digitalis in diminishing the number of the contractions of the heart and arteries, but it happens because the irritating cause, the water, is removed, and the effect on the pulse is different from that which might have been observed, if the water had been removed by the art of the surgeon. In order to elucidate my meaning, let us

suppose, that a person's pulse is, in a given state of body, 80 and feeble, but that water being collected in the thorax, has raised it, and keeps the number about 120; if the water were drawn off by means of the appropriate instruments, a trocar and canula, the pulse, after the immediate effects of the operation had subsided, would be 80 and feeble; but if the water were removed by the digitalis, the pulse would be about 95 and pretty strong, so that the digitalis would *virtute sua* have augmented the force and frequency of the pulse; and this fact it was, I imagine, which made Kinglake declare, "that a pulse at 90, soft, full and firm, is the *sine qua non* of the beneficial effects of the medicine."

It is however, necessary to remark, that, if the dropsical effusion is combined with local inflammation, or, if the effect of removing the effusion is not produced during the administration of the digitalis, the pulse is increased, both in force and frequency, as on other occasions.

It seems to have been neglected, that there is an important difference between the reduction of the number of the pulse by the removing of an immediate irrita-

tion, and that, by exhausting the powers of life while the irritating cause remains.

Some physicians dread the substance now under consideration, because it has often produced the most alarming symptoms, without having been of any service to the patient; but if they had been aware of such circumstances as those just pointed out, their disappointment would probably not have occurred.

It has appeared, I trust, that the speedy diminution of the number of the pulse, after the use of the digitalis is begun, either in debilitated constitutions, or in cases of dropsy, is not to be ascribed to any sedative power; and with regard to any immediately irritating cause, I would further add, that, whenever such a cause is removed, the arterial system will gradually resume its healthy action.

If the irritating cause is pus, anywhere collected, when the pus is removed, the morbid increase of action dependent on it will cease in the sanguiferous system; but this effect is not to be attributed to a sedative power, any more than the removing of febrile symptoms by opening an abscess,

is to be attributed to the sedative power of the lancet.

If digitalis promotes the healing of a sore, or the absorption of pus in the lungs, the consequent diminution in the frequency of the pulse is to be ascribed to the removal of the cause, not to a sedative power. In like manner, in convalescence from all diseases, in which the pulse has been morbidly accelerated, it gradually resumes its healthy number; but is this to be ascribed to a sedative power?

When febrile exacerbations abate, the pulse diminishes in force and frequency; but this is no more to be ascribed to the sedative power of any medicine previously taken, than the increase of force and frequency during the exacerbation, to the operation of a stimulant medicine.

In short, when the pulse is lowered in consequence of the digitalis, independently of any other circumstance, this effect indicates a diminution of the contractibility of the heart and arteries, as well as great exhaustion of the powers of life; but when it is diminished by the removal of irritation, this indicates the restoration of those powers to the equilibrium of health.

The contradictory accounts and strangely hypothetical notions in which every author has involved himself, might alone have induced us to suspect the soundness of the doctrines on this subject; but I feel peculiar satisfaction, that the result of experiments will enable us to reconcile all those contradictory accounts, and show, therefore, that the cases recorded by authors differ in no essential particular from those which I have detailed; nay, so palpable does this appear, that if these gentlemen had but read their own cases attentively after they wrote them, their conclusions would have exactly coincided with mine.

In short, this is the best example which I know of erroneous reasoning from sound data, and proves, that the Aristotelian mode of reasoning is as necessary to enable us to form sound conclusions, as that of Bacon, to enable us to procure sound principles.

For the sake of illustration, I shall give a syllogistic arrangement to the facts which these authors have related.

The pulse diminishes in number during the administration of digitalis, but this substance is taken for a length of time before this diminution occurs, therefore the dimi-

nution is not the immediate effect of the digitalis.

If they had next recollected, that all the symptoms of inflammatory disease were often aggravated during its administration before any diminution supervened, they would have been led to imagine, *that the digitalis might have some other power than that of diminishing the number of the pulsations*, and consequently would have perceived, *that its first effect is that of increasing the pulse in force and frequency*; having proceeded so far, they would have observed, that after the digitalis was taken for some time, the pulse then, and not till then, diminished greatly in the number of its beats; *ergo, the immediate and proper effect of the digitalis is directly stimulant, and the diminution in the number of pulsations is the consequence of the previous increase;* thus, it appears incontrovertibly, that the facts, which authors have related, rigorously considered, would have afforded no general conclusions different from those which I have judged myself warranted to form, and thus also would have vanished all their difficulties in explaining the operation of the substance. In fine, *that the first effect of the digitalis is*

stimulant, and that the lowering of the pulse is a secondary effect, will explain all the cases, and reconcile all the contradictions in the writings of medical men on this subject.

I suppose, that besides recollecting this general fact concerning the operation of digitalis, that the observer is at the same time on his guard against any circumstances which might mislead him. I have pointed out the most important of them, but there are others of which it is very useful to be aware.

Age and sex; the particular condition of the body with regard to health and disease; the previous habits, whether of temperance or dissipation; the particular disposition of the mind, and the passions which actuate it; the substances taken into the stomach either for food or for pleasure; the length of time after taking food, and the kind of food that has been taken; the particular time of the day, whether morning, middle part of the day, evening or night; whether the person has been lately exercising, and how; the posture of body, and the change of posture from lying to sitting, and from this to standing—are all circumstances which, in a special, and per-

haps I might say, in a specific manner, influence the sanguiferous system; the neglect of which will greatly diminish the value of any observations on the pulse. What I now mention has been partly anticipated in the treatment of the suppurative stage of consumption, and I think it only necessary here to suggest these things to any one who may incline to make observations on the pulse, as I shall endeavour to examine these topics afterward; my reason indeed for introducing them here is, that many gentlemen, who repeated the experiments on the effects of digitalis, have informed me, that their results were different from mine, who afterward found, that they had been misled by not attending to some of the circumstances now pointed out.

In a discussion which took place in the Medical Society last winter, on the powers of digitalis, one gentleman stated, that he had made five experiments on himself, and in every one of them the result was contrary to the results of mine; another stated, that he had taken it repeatedly during these three years, and always found, that the digitalis diminished the force and frequency of his pulse;

I replied, that many mistakes might occur, but I had only one answer, that we should meet together and take a dose of the substance. Five of us retired to another apartment in the Society; Dr John Gordon, President of the Society, counted the pulses and administered the dose to each; the event was, that the pulses in four persons were immediately increased in force and frequency. The pulse of the gentleman, who said, that he had repeatedly taken it during these three years, was increased in number by 13 beats per minute. The pulse which was not increased, is also easily explained, and is a proof of the necessity of attending to every particular: the gentleman had been keenly engaged in the debate; on retiring from the Hall of the Society, his pulse beat 116, and was rapidly diminishing in number; in five minutes it beat only 100 and was still diminishing in number, but a few drops of the tincture of digitalis now given arrested instantly the diminution, and it continued 100. The gentleman who had made the five experiments, and I, met next morning; he took 20 gtt. of the tincture of digitalis, which accelerated his pulse instantly, and

at the end of an hour it was 10 beats more than it was immediately before he swallowed the substance.

Walking at an ordinary pace raises the pulse by about 30 beats, but on sitting down it resumes its usual number in a few minutes. Suppose, that the usual number of a person's pulse is 60, that by walking it is encreased to 90, if now on sitting down he take twenty drops of the tincture of digitalis, his pulse instead of being reduced in a few minutes to 60 will beat about 75, and at the end of an hour will be 70, the number which it would have been if he had taken the quantity of digitalis when his pulse was 60; so in the one instance it prevents the diminution in the number of beats by 10, in the other it accelerates it by 10. This I have ascertained in my own pulse very often.

SECTION IV.

Comparative Effects of the Digitalis.

THE powers of this substance indeed are so extraordinary, that it is not surprising, that its effects were, at first, misunderstood; for on comparing and examining critically the different cases which are published, it will be evident, that, though all active substances sooner or later exhaust the powers of life, none have been so remarkable for speedily exciting inflammatory action, and terminating so soon in diminution of arterial action with the most alarming debility. In short, if we wished to know, what would be the effect of a substance applied to the animal body, which had the power of speedily raising its functions to the highest activity of which they were capable, we may acquire this information from the cases in which the digitalis has been employed.

When we review the various powers which act on the body, and by their excessive operation exhaust the powers of life,

we shall find them very different in their effects from those of the digitalis.

Common food and exercise which support those inevitable changes terminating in old age, are not found, toward the end of the longest life, to have diminished the pulsations in any other respect than in their vigour and regularity.

The effect of fatigue of body is great debility with a quick and feeble pulse. Some indulge in the use of the richest viands to excess; others, in that of various liquors containing alcohol, and persist in such practices, or even in every variety of dissipation for years, before they accomplish their own destruction. I have frequently observed, that persons who had been accustomed to the use of ardent spirits, had, when they thought themselves in health, a pulse of not above 50 per minute. Of two persons, I recollect well, that in one the paroxysm of hectic fever scarcely ever raised the pulse above 70, and the other, some eminent physicians pronounced free from fever, because his pulse was not above 90; but, instructed by my previous observations on the pulses of different persons, I suspected, that this was a very quick pulse for this

man, because a considerable quantity of beef-steak, and nearly two pints of port wine, which he one day thought proper to take, did not accelerate his pulse by above two beats per minute. This person died of a cancerous affection a few weeks after the above observation was made, but his pulse never beat above 100 per minute.

The mode of comparing the present state of the pulse with its previous habit, has, I believe, been too much neglected, and I have sometimes imagined, that the accounts, which we have of fevers without acceleration of pulse, have originated in this neglect.

If a physician is called to a person whom he has not seen, and whose pulse is not above 70, though he has the other symptoms of fever, he may, from this circumstance alone, judge what has been the previous state of the pulse; and, if the patient is in a debilitated condition, and such as requires wine, or the more active medicines, and if a pint of port wine, or any active substance, when taken, do not instantly make some alteration in the pulsations, it may be deemed an infallible proof, that the

contractibility of the heart and arteries has been exhausted by the previous manner of life: both the men above alluded to had for many years led lives of unparalleled inebriation.

On the contrary, however old a man is, if his pulsations are readily influenced by common food, by a little wine, or by a small quantity of any of the more active substances, we may thence judge, that this has been a temperate man, and may promise recovery in circumstances in which, without the knowledge of this fact, we could scarcely expect, that even the best treatment would succeed.

The common causes of disease can excite the highest degree of inflammatory action of which the body is susceptible, but, except in hydrocephalus, the diminution of the pulse is in its strength chiefly, while the pulsations remain very quick and very irregular.

I at one time thought, that the extreme debility and sickness which often supervene to the febrile hectic exacerbation, with vomiting and expectoration of purulent matter, would, from the similarity of the general symptoms to the effects of the

digitalis, be accompanied with a slow pulse. In such circumstances I have observed the pulse to beat below 90, weak and fluttering, but most frequently about 120, irregular and feeble, and never to be compared with the pulse which accompanies similar symptoms induced by the digitalis.

In comparing the digitalis with other substances used as remedies, we shall find, as has been already said, that it exhausts the contractibility of the heart and arteries more speedily than any other with which we are acquainted.

Like other substances, digitalis loses its efficacy by repetition; but when this ceases to raise the pulse immediately, other stimulants of the strongest kind have no immediate effect; on the contrary, though the other stimulants produce no immediately perceptible effect, the digitalis will directly increase the force and velocity of the circulation. Even after the digitalis has reduced the number of pulsations to below 50, the effect of 20 drops of it will instantly be evinced by an increase of their force, their frequency, or both.

According to the experiments of Crumpe, opium also immediately increases the num-

ber of pulsations, but its power in this respect is much less than that of the digitalis.

Substances, *cæteris paribus*, can only differ in their effects by their quality or their quantity; we have observed, in the cases detailed, that digitalis, considered in both points of view, is more active than alcohol, ether, opium, scilla maritima, and several of the preparations of the different metals. Even the muriat of mercury, and the white oxide of arsenic taken in an admissible form and safe dose, have never yet been known by their repetition to produce the diminution of pulse, except in fainting. As to the muriat of mercury, I know well, that it, like most of the others, produces emaciation, extreme debility, headach, vomiting, diarrhœa, tormina, and other very distressing consequences, and not a slow, but a very rapid and feeble pulse, easily influenced by change of posture, and the least mental agitation.

I have watched the effects of the extract of hyosciamus, taken in pretty large doses for a long time, but they never in their remote consequences resembled the digitalis.

For many months I have watched the effects of phosphoric acid and of phosphorus dissolved in ether, exhibited in paralytic cases, and in those of molities ossium. This medicine produced a quick, full and mild pulse, with diaphoresis and an increase of the urinary discharge; it at the same time invigorated the muscular energy of the paralytic limbs, but the pulse did not, in that time, evince any consequent diminution in its activity.

I have observed, that the tincture of cantharides could be gradually increased, till the dose amounted to ʒss. per diem. Pains were excited in the urinary organs, in the bowels, in the thorax, and in the head; the pulse was kept much quicker and stronger than it had been before the administration of the medicine; but at the end of two months ʒi. for a dose did not accelerate the pulse by one beat. In other cases, I have found the pulse become feeble under their use, and the doses now seemed to have lost the power of strengthening it; in one instance, after cantharides had been exhibited three months successively, with the view of promoting healthy action in a very desperate phagedenic affection of the face, and

their use carried as far as boldness directed by prudence would warrant, the system seemed very much enfeebled, or rather exhausted; the pulse was now about 120, and only evinced feebleness and irregularity; so different are their effects from that tardiness of contraction which the digitalis will not fail to induce in a much shorter time. From what has happened however, in certain persons who had accustomed themselves to the use of ardent spirits, we have reason to believe, that in a greater length of time, the continued use of all these more active substances would destroy the contractibility of the heart and arteries in the same manner as the digitalis; and in so far, we have some data to decide the long agitated question, whether the action of substances, which influence the general powers of vitality, differs in kind or degree?

SECTION V.

Administration of the Digitalis.

HAVING ascertained, by experiment, that the medicinal properties of the digitalis are of a nature directly opposite to that of which they are generally believed to be; and having shown, that on this principle, and on this principle alone, the contradictions of authors on this subject can be reconciled, the operation of the medicine in the cases reckoned anomalous, explained, and the circumstances, which led physicians into the mistake, pointed out; I shall now proceed to consider the mode of administering the remedy which the change in our knowledge of its operation suggests.

We have seen, that the increase of the pulse, and the accession of inflammatory symptoms, guide us with certainty to secure the good, and with safety to avoid the bad effects of this substance.

The rule, accordingly, of its administration, is to commence it in small doses, which must be gradually increased in pro-

portion to the difficulty of exciting inflammatory symptoms, and when the pulsations become too strong and rapid, along with other signs of inflammatory action, the dose is to be diminished, or the use of the substance to be intermitted.

From the great activity of the digitalis it is obvious, that it must be prescribed for the invigorating of the debilitated. The tincture, I have found to be the best form in which to prescribe it, as the quantity of the medicine is more accurately known, and the dose is more easily taken by the patient.

The dose, at first, is from 5 to 20 gtt. in a little cold water, or wine diluted with water, two or three times a-day.

The smallest doses must be prescribed to the youngest and most excitable persons. Those, whose constitutions are exhausted by chronic diseases, are more benefited by the remedy, and take it in greater doses and for a longer time than others.

Those, whose diseases originate in sudden depletion or loss of blood, are most liable to inflammatory action from the continued use of the digitalis, which seems to corroborate the opinion, that the susceptibility

of action in the animal body is much greater in that state of debility which arises from the abstraction of those powers which act on the system, than in that which succeeds excessive action.*

The rule, to stop the exhibition of the digitalis when the symptoms approach to violence, must be strictly observed in cases of local inflammation, where some degree remains of the inflammatory diathesis, as often happens in the puriform stage of phthisis pulmonalis,† or in the milder diseases of any kind, in which it is administered; but when the system is very much debilitated in consequence of excessive action or chronic disease, as is most frequently its state in dropsies, the doses must be gradually increased, and their use persevered in, until the pulse begin to diminish in number, when some of the other powerful tonics are to be substituted, none of which are in general preferable to cinchona and the submuriat of mercury conjoined with opium. The pulse will, in cases of the latter description, diminish by 20 or 30

* *Vide* Joan. Brunonis, Princip. Medicinæ.

† Treatment of the Second Stage of Phthisis.

beats, and even continue to diminish a few beats daily for three or four days, without any sickness, vomiting, or any sign of increased exhaustion, but often the contrary. We must always however, warn those who have the charge of the patient, to give no more of the medicine after sickness or vomiting has attacked him.

This remedy is most conspicuously useful in every serous effusion, whether the fluid is contained in the cellular membrane near the external surface of the body, or in any of its interior cavities.

To those, in whom such varieties occur, the dose should not be given during febrile exacerbation, but when it abates; not when the mind is cheerful, or countenance animated, but when it is despondent.

When the digestive organs are unable to perform their functions easily, that is, without cardialgia, flatulent discharges, tormina, &c. immediately after taking food, the dose of the digitalis should be given in a little wine, or along with some agreeable aromatic or cordial, a few minutes before the patient takes his food.

It has been affirmed of late, that there is a species of pneumonia, which is cured by

the digitalis, and in which venæsection must not be employed; but the complaints, which are said to be of this nature, appear to me to have chiefly depended on anasarca of the lungs.

The digitalis must not be exhibited in any other than passive inflammations.

When the patient is affected with diarrhœa, let opiates be given along with the digitalis.

I cannot refrain from reprobating the proposal of blood-letting, purging, &c. to make such a change in the constitution of the patient as might give a chance of success to the digitalis,* which would certainly be speculating in the treatment of disease beyond the boundaries of reason, prudence and humanity.

Since by an evident deduction from numerous facts carefully ascertained, I have established a principle for the administration of digitalis, the opposite of that which guides the practice of physicians, it might be expected, that I should advise it to be prescribed in morbid affections opposite in nature to those in which they employed it,

* Withering on the Fox-Glove, p. 190.

but in this we have an instance of that struggle which must ever subsist between the influence of fact, and of opinion founded only in prejudice; for it has been employed both in sthenic and asthentic disease, and even in combination with the most powerful stimulants to assist, according to them, its sedative effects.

To illustrate what we have said, we shall quote from a work in common use, the Edinburgh Dispensatory, in which the supposed effects of the remedy, and the diseases which authors have advised to be treated by it, are enumerated.

" Its effects, when swallowed, are,

1. " To diminish the frequency of the pulse.

2. " To diminish the irritability of the system.

3. " To increase the action of the absorbents.

4. " To increase the discharge of urine."

Internally, digitalis has been recommended,

1. " In inflammatory diseases, from its very remarkable power of diminishing the velocity of the circulation.

2. " In active hæmorrhagies, in phthisis.

3. " In some spasmodic affections, as in spasmodic asthma, palpitation, &c.

4. " In mania, from effusion on the brain.

5. " In anasarcous and dropsical effusions.

6. " In scrofulous tumors.

7. " In aneurism of the aorta, we have seen it alleviate the most distressing symptoms."

Here we have an epitome of all the absurdities of writers on the effects of digitalis: here are ludicrously attributed to it the contradictory effects of diminishing the frequency of the pulse with the irritability of the system, and of, at the same time, increasing the action of the absorbents.

In like manner it is recommended in the violence of inflammation, in active hæmorrhagies, as well as in the extreme debility of general dropsy; in scrofula where inveterate torpor reigns; in spasmodic asthma and palpitation which require the most powerful remedies, as assafœtida, camphor, musk, opium, ether, and in aneurism of the aorta where such substances are justly deemed most dangerous.

The same contradictory influence of truth and hypothesis, made Beddoes, as has been already noticed, declare, that the robust, and Withering, that the feeble, were best fitted for the reception of the digitalis.

What are we to think of an immediate sedative, the efficacy of which is often promoted by the addition of the most powerful stimulants, equally useful in active inflammation and its consequences; a substance, which at the same moment most powerfully subdues the energies of life, and renovates with admirable virtue the almost exhausted body?

It must appear fortunate, that experience has improved our knowledge of the properties of the digitalis, and taught us to substitute the above simple rule for the one now commonly received; viz. "to continue the use of the substance till nausea, sickness, vomiting, and diminution in the number and strength of the pulsations supervene;" which seems to me just as rational as to say, Continue devouring rich viands, till surfeit; drinking ardent liquors, till intoxication; or rather continue the intoxication itself, by their use, till sickness, vomiting, and great exhaustion supervene: for accu-

mulated disease with exhaustion, and, I fear, not rarely death itself, have been the consequences of the unguarded or indiscriminate administration of the digitalis. It is fortunate, I repeat, that a substance, which is the terror both of physicians and patients, but which, on account of its infinitely superior efficacy, should be employed in different periods of every consumption, in alalmost every dropsy and other diseases of general debility, can be managed in the mild, as well as the alarming degrees of such morbid affections, with as much ease as the mildest and least effectual substances.

Let no man think such inquiries the insignia of abortive labour, for in them are involved the lives of individuals, the happiness of families, the prosperity of nations.

FINIS.

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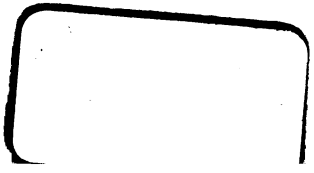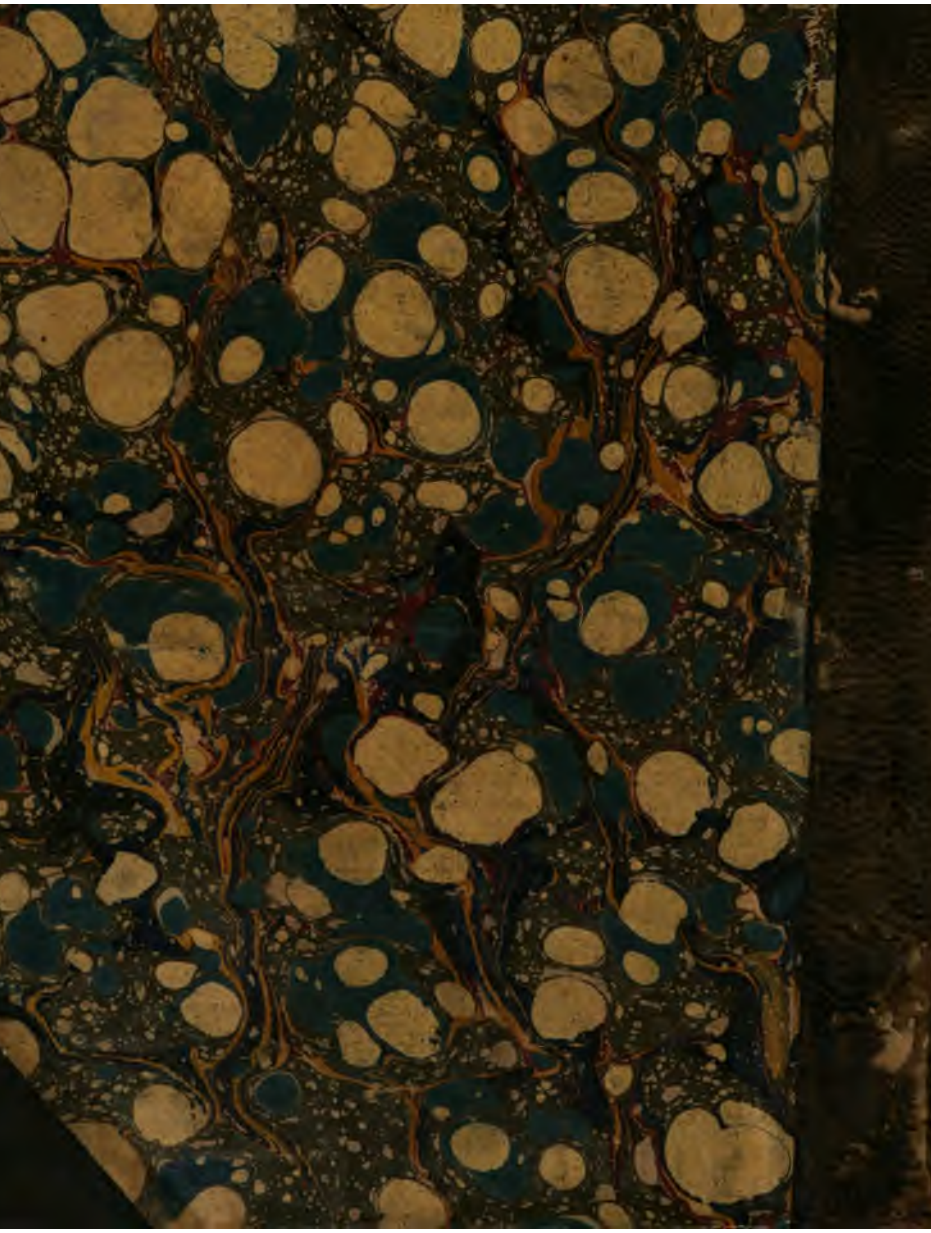
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